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A Comparative analysis of Water, Sanitation and Hygiene Practice of Two Vulnerable Groups of Population – Marma Tribe of Bandarban and Dhaka City Slum Dwellers, Bangladesh

By
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Abstract

Nation's developmental process runs on the basis of three different factors, which are human resource development, economic development and also social development. All these developments are done by – human being and some other related factors. We all know that, "health is wealth" – which means that when a person is healthy then he/she would be wealthy and productive in general. Health is one of the central factors for the development of any nation. In our daily life we practice many things to make ourselves healthy, through nutritious food, fresh environment, hygienic sanitation, healthy lifestyles and other factors. Generally, these practices are reported more by those people who know and have strong awareness about safe WASH (Water Sanitation and Hygiene Practice; WHO-2030 agenda has used this short form) system. Unfortunately some groups such as slum dwellers, poor migrants, street people, and tribal population are highly disadvantageous in terms of above mentioned daily practices. Considering this background, this study has chosen two particular groups (Marma tribe population & urban slum dwellers) who are vulnerable in terms of socio economic development. This study has been conducted through both qualitative and quantitative study as both are important to analysis for descriptive study. Sample size and sample areas have been chosen in purposive and systematic sampling way. Total 260 households have been selected as sample, where 200 households were from urban slum area and 60 households were from Marma tribe stays in Bandarban district. The main intention of this study was to find out the practice system of WASH by the study area people and how those are affecting on their health condition. Throughout the study it has been found that people of these two groups have knowledge about safe WASH system but they do not have that much awareness about the ways. In statistical analysis independent variables were their socio economic studies, way of water usage, how they are practicing sanitation system, and other hygienic practices. These variables deeply depend on people's health condition, that's why dependent variables were different types of water borne and infectious diseases and also skin diseases. If people cannot practice hygienic lifestyle they can get affected by Diarrhea, Cholera, Dengue, Chikungunya, and other skin diseases. Diarrhea is a very common epidemic of this country from the early years. It spreads a lot through different types of unhygienic practices. Now a day tension about this disease is getting reduced because people are being more knowledgeable about this and they know minimum level of primary treatment to prevent this. Day by day different and new types of diseases are coming out and spreading challenging situation among people. People are more tensed about the new infectious diseases which are spreading widely. One of the new diseases which have spread out among the people of Bangladesh, especially in urban areas, is- Chikungunya. Mainly through a type of mosquito this disease gets spread out. People get affected with this in a large number. Throughout the study it has been found that people of selected areas mostly got affected with Chikungunya rather than other diseases. In slum area this number is higher than Marma. Comparatively Marmas are more vulnerable with Diarrhea than Chikungunya. So, we can see that different area people can have different types of diseases on the basis of their lifestyle. It has been found that Marmas mostly do not boil drinking water, that's why they have to suffer with Diarrhea more than Chikungunya. On the other side, slum dwellers mostly boil drinking water but their other living conditions are not good and hygienic in any way. Like- many people stays in one tiny room, most of the rooms are made by bamboo and built on the open drainage system. So, lots of mosquitoes stays in those drains and those bite the slum dwellers and these result huge epidemics of Chikungunya among these people.

In national level we have found out Diarrhea is the most common epidemic but this results vary from study area. Cholera or Diarrhea these are age old disease. Although its incidence is declining and new diseases such as Chikungunya or Dengue are emerging. Moreover, this study has been conducted with selective sample which cannot represent whole nation. Because in national level way of practicing WASH system is different in terms of their knowledge, their geographical condition, their socio-economic condition, and so on. Diarrhea is observed nationwide while Chikungunya is mostly centered on urban areas. Basically what is true for the whole is not true for selective areas or persons. This is call ecological fallacy.

From this study it has been found that they have knowledge about safe WASH practice but they are not aware about their practicing system. It happens due to lack of proper education, lack of implementation of rules and services from government and also lack of responsibilities of authoritative member. We need to sort out these problems to come up from these epidemics and help those socially vulnerable groups.

Key words – WASH (Water, Sanitation and Hygiene Practice), Marma, Urban slum dwellers, Communicable diseases, Skin diseases, Water borne diseases, Health service center.

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Chapter – 1
Background

1.1 Introduction

Adequate water and sanitation hygiene are most essential components in terms of health for each and every person. Hygienic practice can make people's lifestyle better and healthier. Right now it is one of the main concerns for Bangladesh because good health condition is one of the major elements to experience socio economic development. To increase economic growth people need to think first for human resource development, because such development can happen if the person can stay active and well-nourished and do hygienic practices. Health care services from different health care centers are being provided on every sector to prevent and also to cure the infections and spread of diseases.

About 45 different Tribal groups are now living in Bangladesh, mostly in the districts of Rangamati, Khagrachari, Rajshahi, Sylhet, Bandarban, Chittagong, and Cox's Bazaar. Adequate health care services and knowledge regarding safe water and sanitation system cannot reach at micro level due to insufficient attention from concerned authorities. Consequently these tribal people are used to be affected through many types of infectious diseases and also through water borne diseases due to unhygienic water and sanitation practices. To get the safe drinking water they need to go far from their houses and those water sources are not totally safe to drink. They still use unhygienic sanitation and even sometimes some people used to practice open defecation. Although their overall condition is being developed through education, health care facilities, like "Kollyani Shastho Sheba" but still they get infected frequently.

It is not only a matter of rural and tribal areas; basically it is a common matter for all vulnerable groups. For example, urban slum dwellers are frequently getting affected by infections due to unhygienic practices. These people are not using fresh drinking water and hygienic sanitation practices due to inadequate facilities, limited knowledge and awareness, and so on. Quality of water, sanitation system and unhygienic practices has a significant impact on the health particularly on children. They tend to practice all types of unhygienic activities, which substantially affect their health. Available evidence suggests that most of the slum dwellers are suffering with many types of infectious and water borne diseases just because of their unsafe WASH (Water Sanitation and Hygiene Practice; WHO-2030 agenda has used this short form)system. This study focused on the real scenario of WASH system of Marma communities of Bandarban district and slum dwellers of Dhaka city. Due to contextual, cultural, behavioral and other factors, health problems of these two groups could be different. However, limited information are available until recently for the questions like "how they differ in terms of health determinants mainly related to water, sanitation and hygiene practices and how these factors are associated with their health conditions.

1.2 Research Questions

Based on the abovementioned background, the research questions are formulated as follows:

1. What are the differences between Marma Tribe and Dhaka City Slum Dwellers in terms of water, sanitation and hygiene practices?
2. How these practices are associated with their health conditions?

1.3 Objectives

To address our research questions, this research has set both general and specific objectives. The general objective of this research is to–

Assess the prevalence of safe WASH system among the study population.

Additionally, following specific objectives are set:

1. To knowhow study population got affected by infectious and water borne diseases focusing on their water, sanitation and hygiene practices
2. To find out their level of knowledge and their awareness about safe WASH system
3. To compare their situation with national level situation and find out the gaps.

1.4 Hypotheses:

1. Availability/ access to safe drinking water, sanitation and hygiene practices are likely to be inadequate as compared to national level.
2. Prevalence of infectious diseases (Diarrhoea& Chikungunya) will be higher who use poor drinking water, poor sanitation and unhygienic practices.
3. Lack of awareness regarding safe WASH system makes the study population vulnerable regarding their developmental process.

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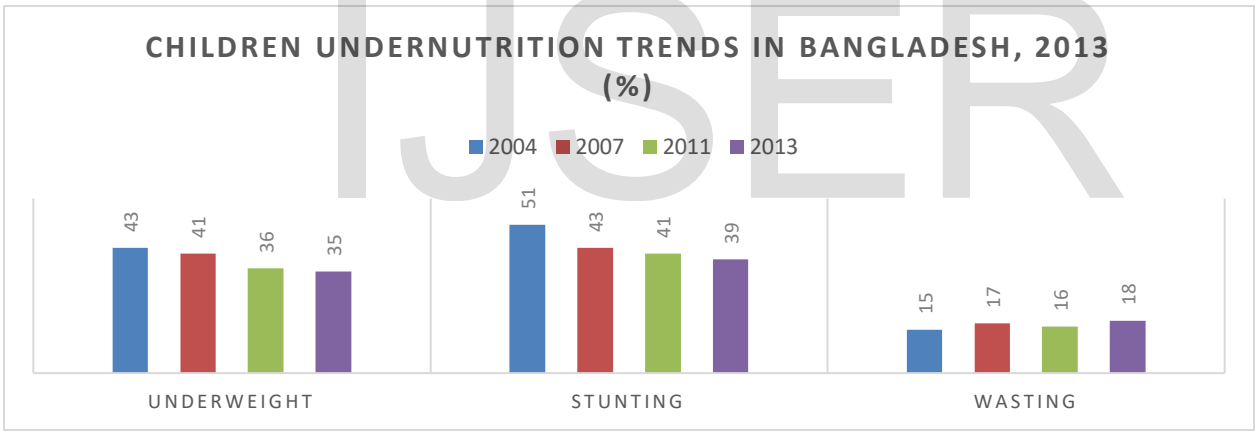
Chapter – 2
Literature Review

Use of safe drinking water, improved sanitation and hygiene practices necessarily leads to improved health. Health attendants has given clear evidence about washing hand at some important time, like- after defecation and before having meal is mandatory for all. Hand washing with soap can significantly reduce the incidence of Diarrhoea, which is the second leading cause of death of 'under five children' throughout the world (UNICEF, 2003). According to UNICEF, about 50 percent of diarrhoea can be reduced just by washing hand with soap after defecating and before having meal. Besides that it also reduces other infectious diseases, like- pneumonia, cholera, skin diseases, and so on.

Absence of using safe water, decent sanitation system and good hygiene can result devastation of health and wellbeing of people. Countries like- India, Bangladesh or any other developing countries especially least developed countries are mostly at high risk of various infectious diseases, like- Diarrhoea, skin diseases and water borne diseases. Most of these are transmitted through contaminated water, food and unhygienic practices. An estimate provided by World Health Organization (WHO) showed that– unsafe water, sanitation and hygiene are the leading global risks for death. These are responsible for 1.9 million deaths in 2004. They also added that around 10% of the total burden of disease worldwide could be prevented by improvement of drinking water, sanitation and hygiene practices.

In Southern Africa from total under nutrition population, about half of under nutrition is associated with inadequate water, sanitation and hygiene practices, because diarrhoeal diseases and parasites prevent people from absorbing nutrients from food. This under nutrition can make people stunted and wasted which results imbalanced body mass index (BMI) (Water Aid, 2016).

Figure 1: Prevalence of underweight, stunting and wasting in Bangladesh during 2004 to 2013



Source: Iffat Mahmud and Nkosinathi Mbuya, The World Bank study, 2016.

More than 1 in 3 young children in Bangladesh suffer from various illnesses including physical, mental and cognitive developmental delays because of poor nutrition (NIPORT, 2016). Poor nutritional status of mother is the main cause of child's poor nutrition. In other words, if mother cannot have proper food and nutrition then her child will also suffer from poor nutrition.

Figure 1 presents the trend of under nutrition statuses of 'under five children' in Bangladesh for the period of 2004 to 2013. Nutritional experts say that lack of accessibility and availability of safe drinking water, good sanitation and hygienic practices are the leading cause of these outcomes (World Bank Group, 2016).

Water borne and infectious diseases are not only causing bad conditions of health but also limiting human resource development. People generally lost their abilities to be productive and cannot participate in socio economic development due to these problems. These infectious diseases even keep children absent to attend school and adult to join their work which results shortage of future potential and reduction of income. To the end we can say that limited access to pure drinking water, good sanitation and poor hygiene practice substantially undermine country's economic growth and development.

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Table 1: Trends of life expectancy at birth, per capita GNI and HDI in Bangladesh, 1980 - 2012

Year	Life expectancy at birth	GNI per capita	HDI value
1980	55.2	.649	.312
1985	56.9	.715	.333
1990	59.5	.762	.361
1995	62.1	.860	.397
2000	64.7	1.003	.433
2005	66.9	1.220	.472
2010	68.6	1.631	.508
2011	68.9	1.701	.511
2012	69.2	1.785	.515

Source: Bangladesh's HDI trends (UNDP, 2013)

From Table 1 we can easily infer positive relationships between three indicators at the national level. The more life expectancy at birth got improved in Bangladesh the more Gross National Income (GNI) got increased. Generally life expectancy at birth is an outcome which depends on various factors. Some of these factors are e.g. modern healthcare services, hygienic practices and availability of safe drinking water. Human development index (HDI) also plays an important role in increasing life expectancy. According to the study of Khan et al (2011), the development in socio-economic and health sectors at the national level does not necessarily mean that all segments of the society are equally benefitted. Some groups (e.g., rich, elite) are getting more advantages than others (e.g., poor). So, group-specific analyses are sometimes imperative. From this justification, this research has been designed to check actual performance of water, sanitation and hygiene practices among Marma tribe in Chittagong division and urban slum dwellers in Dhaka.

Improving global access to safe drinking water and safe sanitation is one of the least expensive and most effective means to improve public health and save lives. The U.S. and Central Europe, where water and sanitation services are nearly universal, significantly reduced water-, sanitation-and hygiene-related diseases in the 20th century by protecting water sources and installing sewage systems. However, in developing countries, water and sanitation services are still severely lacking. As a result, millions of people suffer from preventable illnesses such as- Diarrhoea, Cholera, Chikungunya, and die every year. Although the percentage of death caused by Diarrhoea has dropped by 5.5% during the period of 2001 to 2016, still many under-five children got affected and even hospitalized (Dhaka Tribune, 2017).

Many obstacles must be overcome to improve these statistics. Approximately 3 in 10 people worldwide or 2.1 billion, lack access to safe and readily available water at home, and 6 in 10, or 4.5 billion, lack safely managed sanitation (WHO, 2017). The Joint Monitoring Programme (JMP) report on "Progress on drinking water, sanitation and hygiene: 2017 Update and Sustainable Development Goal Baselines" presents the first global assessment of "safely managed" drinking water and sanitation services (UNICEF, 2017). The overriding conclusion is that too many people still lack access, particularly in rural areas. Bangladesh had made significant progress in improving the health of its population, and was one of the few developing countries that were on track to achieve Millennium Development Goals (MDGs) 4 and 5. On top of the progress, in 1990 the infant mortality rate was 100 deaths per 1000 live births and by 2006 it had declined to 52 deaths per 1000 live births. By 2016 the infant mortality rate further declined to 28.2 % (World Bank, 2016). At the global level, the WASH Poverty Diagnostic Initiative recommended three ways to ensure safe and sustainable water and sanitation for all, those are (i) coordinated investments and interventions, (ii) allocation of future investments in proper way, and (iii) governments need to understand the gap between policies and interventions (The World Bank, 2015).

The overall situation of Bangladesh has improved in terms of both sanitation and water, but low levels of sanitation and arsenic contamination in ground water remain important public-health threats. As of 2003, according to the government, some 42 percent of Bangladeshis does defecation themselves along roadsides, behind bushes, aside homes or wherever they could find a place to go (Anas, 2017). Since open defecation is linked to transmission of many diseases, such as Cholera, Diarrhoea and Dysentery, still, the quality of sanitation coverage is an important public health issue. Latrines situated mostly in remote areas are still classified as "unimproved." Drinking water access is widespread, but half of the drinking water consumed fails to meet water safety standards. In urban areas of Bangladesh, piped water supply reaches only about one-third of the population, and there is no systematic sewer disposal and treatment system. Only Dhaka, Bangladesh's capital city has a sewerage

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system, and it has served only around 18 percent of the city (World Bank, 2016).

Convincing people to defecate in a fixed place is a first step in sanitation improvements. UNICEF Bangladesh has involved in the largest intensive hygiene, sanitation and fresh water improvement project ever attempted in a developing country. The Bangladesh Rural Water Supply and Sanitation Project, to which the World Bank has committed $43 million since 2012, aims to increase a safe water supply and hygienic sanitation in the rural areas of Bangladesh, where shallow aquifers were highly contaminated by arsenic and other pollutants. The Sanitation, Hygiene Education and Water Supply in Bangladesh (SHEWA-B) project aimed to reach 30 million people in five years (2007- 2011). Low rates of progress in improving water supply coverage reflect the prevailing situation of arsenic contamination of shallow tube-wells (F. Ahmed & T. Ahmed, 2014).

Health care associated infections affect hundreds of millions of patients every year, with 15% of patients estimated to develop one or more infections during a hospital stay (Allegranziet al., 2011). Mostly women and children get affected due to this reason, like every day many children died from preventable diseases, like- Diarrhoea, and Cholera. On the other hand, according to UNICEF (WASH) worldwide 2.5 billion people lack access to improved sanitation; 748 million people lack access to an improved source of drinking water and about 1 billion people practiced open defection. According to daily newspaper (The Independent, 2014-2015), reported that - due to unhygienic practice about 37% children got affected with skin diseases, 32% from fever, and 22% from diarrhoea.

Many other infectious diseases are also spreading with a concerning number. Rather than Diarrhoeal disease some new diseases like, Chikungunya become an epidemic. People are being widely affected with such diseases like, Chikungunya or Dengue. People's lack of awareness and their life style lead them into these tensions. From April 1, 2017, to Sept 7, 2017, the Bangladeshi Ministry of Health reported that about 984 cases confirmed by real-time PCR assay and more than 13,176 clinically confirmed cases of Chikungunya patient in 17 of 64 districts (Kabir et al, 2017). Mainly this disease has outbreak in two continents which are Asia and Africa. In 2016 there was a total of 349,936 suspected and 146,914 laboratory confirmed cases of Chikungunya in these continents (WHO, 2017).

Sanitation and hygiene are critical to good health survival and development. Many countries are still challenged in providing adequate sanitation for their entire population. People of some areas are still at risk to water, sanitation and hygiene (WASH) - related diseases. In these areas absence of basic sanitation and modern latrine system polluting the environment and also creating risk factor for the society. Due to open defecation, open disposal of human wastages, water, land area also get polluted. According to United Nation's Millennium Development Goals Report in Bangladesh one in five girls of primary school are not able to attend school during their menstrual period, as they don't get proper sanitation support, hygienic practice and lack of fresh sanitary napkins. The installation of toilets and latrines may enable school children especially menstruating girls continue higher studies by avoiding the barriers. On the other hand in many areas there is water scarcity. In that case mostly female members of the household have to go far to collect water. So, they need to spend huge time to collect water (UN Water, "Gender, Water and Sanitation", 2005-2015).

In many areas of Bangladesh, particularly those in hard to reach areas, people lack access to improved and sustainable water and sanitation facilities due to challenging environmental conditions, complex social factors and a lack of knowledge of the importance of using improved water and sanitation facilities. As a result, many people do not practice key hygiene behaviors including the practice of effective hand washing with soap at key times, as well drinking arsenic-safe water and using improved latrines (Dreibelbis et al, 2015).

Although Bangladesh has developed significantly with regard to access improved water and sanitation facilities over the last few years, there are pockets of areas that have received very little attention due to geophysical, socio-cultural and economic situation. With very little infrastructural development, road communication network in particular, water and sanitation coverage in these areas still remain much below from the minimum level. Extreme poverty in these hard to reach areas exacerbates the water and sanitation crisis. Government of Bangladesh had set its targets of achieving full coverage of water and sanitation by 2011 and 2013 respectively; these areas need special attention in different aspects of development including technological options, social mobilization, financial resources, and service delivery mechanism because of special geographical, hydro-geological and social setting (NIPORT, 2011). It needs to be verifying again on recent perspective and find out the left lacking, because still there are some vulnerable areas which are not getting access of these facilities. Areas like slum or hilly area are mostly getting eliminated while implementing these plans.

On the basis of needs people started to switch their occupations. Mostly people started to move from agricultural sector to industrial sector. People got migrate from rural to urban areas to seek better life and better employment. Huge number of in-migration between rural to urban have caused huge increase of urban slum areas. Poor people, who come from their villages, generally tend to stay in slums with low cost housing. Though they migrated to city for better life, in many instances they became vulnerable more than before. Their household conditions, environment, and sanitation are not hygienic at all. Their houses are mostly made of bamboos, which are not hygiene to live. Most of these houses are also located in low lands or near the

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drainage system where lots of mosquitoes roam around. Many households together have to share toilet. Generally improved toilet facility is treated as a good indicator for hygienic environment for slum dwellers. Around 42.2% of the slum dwellers use pit latrine, 26.3% use sanitary latrine, 21.1% use tin-built latrine, 8.7% use katcha latrine and 1.9% use open space (BBS, 2014). Good hygienic and sanitation knowledge and the practices are significantly lower among the slum dwellers than non-slum dwellers. Some of the criteria used by the Bangladesh Bureau of Statistics (BBS) to define slums are predominantly poor housing, poor quality or no sewerage and drainage, inadequate drinking water supplies, insufficient or no street lighting, and few or no paved streets or paths. In addition, many slums covered by the BBS study were located near polluted water bodies, swamps or putrid drainage canals. Fresh drinking water, hygiene practices and proper sanitation systems should be accessible to slum dwellers because these factors are related with human right.

Image 1: Typical living condition of Aftabnagar, Rampura area slum

Source: Author of this paper.

The above image of a slum area can show an overview of their WASH practice system. Their houses are located in the area heavily affected by stagnant water, poor drainage and household garbage. Due to their unhygienic lifestyle automatically these people are at high risk of having bad health conditions including water borne diseases.

The review leads us to say that human health and wellbeing are strongly affected by the environment in which we live. Access to water, sanitation and hygiene in everyday life is very important factor influencing good health. Fresh water and proper hygienic sanitation system can lead to good health; can reduce illness and water and environmental related deaths. Improved health system is interconnected with many factors, like- poverty reduction, higher literacy rate, socio economic development and improved quality of lifestyle. So, getting access of fresh water and proper sanitation system is not just related to good health, but also related to national prosperity. If people cannot have fresh drinking water and also cannot use clean and safe water for daily purposes, then they would experience lots of water borne and infectious diseases which can affect their health, workability, personal income and productivity. Very briefly, usage of safe drinking water, developed sanitation and hygienic practices are really needed not only to maintain good health but also for socioeconomic and national development.

Considering the above-mentioned background, two different study areas namely urban slums from Dhaka city and Marma communities from Bandarban district are selected. Selected slums varied by number of populations. Bandarban district is mostly hilly and is not much developed like another hilly district called Rangamati. The people of Bandarban are slightly behind in terms of their knowledge and awareness about different health issues. The overall health care services are also not developed. The poverty rate of Rangamati is about 64%, which is about 74% in Bandarban (CHTDF, UNDP, 2014). Environmental conditions are relatively better in hilly districts. So, Marma tribe communities live in a fresh environment as there is no sound pollution or any kind of traffic jam, contaminated carbon-di-oxide, and so on. Though their environment is fresh and peace also but in terms of safe WASH practice system they are not much aware. Lack of awareness leads them to different types of water borne diseases, especially Diarrhoea. On the other side urban city area is fully overloaded with huge number of population. From this huge number a large proportion lives in slum area which doesn't have a fresh environment at all. As here number of population is larger than its

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land so many people have to stay in one tiny area. Their socio-economic condition also bound them to live in a very unhygienic place. Their living condition and the way they leads their life that causes different types of infectious diseases. One of the leading infectious disease with which they have to suffer most is 'Chikungunya'. This disease caused by mosquito and we know that mosquitoes mostly stay in unhygienic place, polluted water and environment also. Throughout the study it has been shown that how urban slum dwellers and Marma tribe are leading their life regarding water, sanitation and hygiene practices and how their way of living affects their health condition. It needs to know what the epidemical situation of them is.

Chapter – 3

Methodology

3.1 Conceptual Framework

This study mainly analyzed water, sanitation and hygiene practices of two vulnerable groups (urban slum dwellers and Marma Tribe) and compared them with national level statistics. Generally, health outcomes (dependent variables) are associated with various factors including water sanitation and hygiene-related variables. In order to ease our understanding, the following conceptual framework is proposed. According to this framework, water borne and other infectious diseases (considered as dependent variables) are associated with various socio demographic, lifestyles, healthcare factors including other community (e.g. crowding) or environmental (e.g. waste management, drainage) or city (e.g. recreational facility) level characteristics. In our study, most of these variables have been measured categorically.

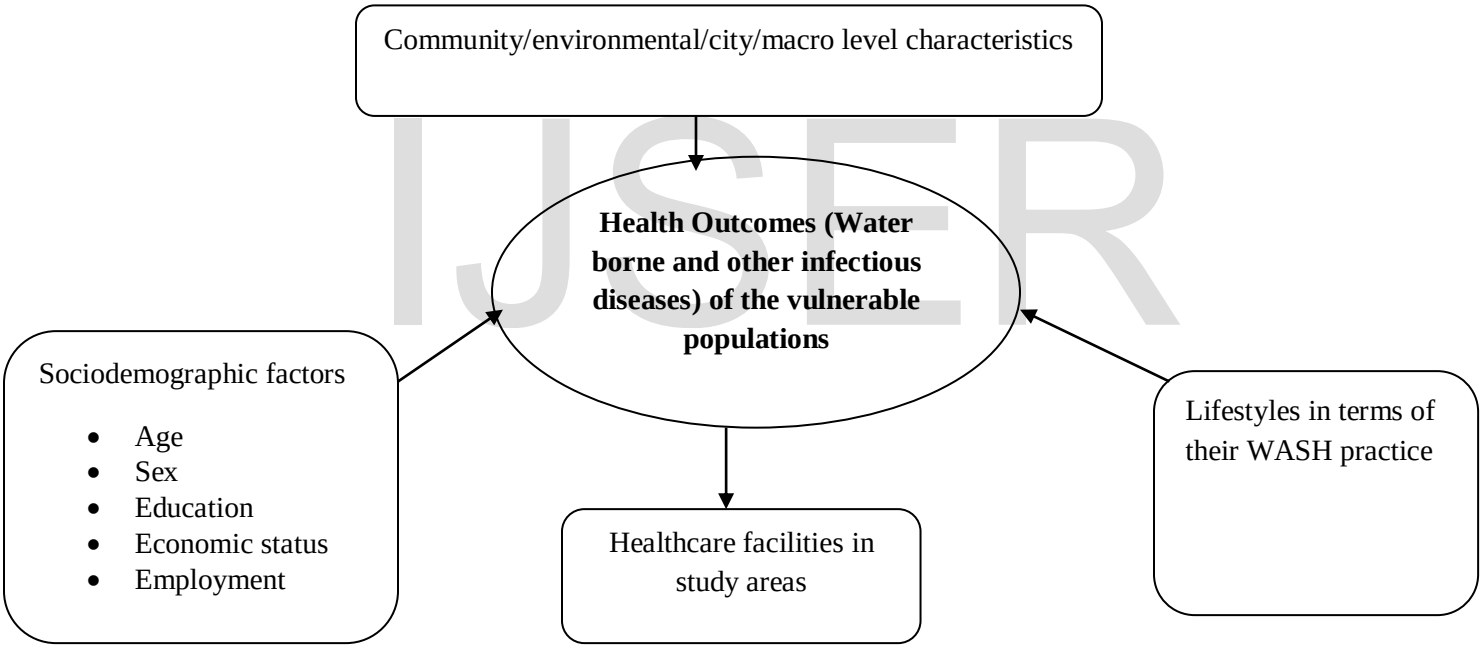

Figure: Conceptual framework to show associations between health outcomes (dependent variables) and other factors (considered as independent variables)

3.2 Study Design

This study has been conducted using both qualitative and quantitative methods. In research study both these studies was needed to get a clear and analytical idea. Qualitative research has been done based on fewer criteria by using a tool which is a tape recorder. After asking some questions, people have discussed about their idea, practice system and how they want to see these things. These discussions has accomplished through group of people. It involves more interactions between researcher and study subjects and provides more opportunities to clarify questions like why and how. In contrast, quantitative research is used to generate statistics based on survey research using tools like pre-tested questionnaires. Through statistical study quantitative method has been used to get a comparative idea between their WASH practice system and their health condition.

3.3 Study Area

This study has been conducted on two vulnerable groups of people.

One group represents Marma tribe community of Bandarban district. The second group of population represents slum dwellers, which were

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selected from different slums (namely Badda, Mirpur, Uttarkhan) of Dhaka city.

A total of 60 households from five different para (Khamadom para, Jamchori para, Girisheva para, Rajbila, KachingMarma para, Roangchori para) were selected for Marma tribe, whereas it was 200 households for slum group. Sample sizes varied between two areas due to difference of total number of population in two areas. According to BBS (2014) more than 2 million slum dwellers lives in Dhaka city slums whereas total number of Marma tribe lives in the whole country is only 0.35 million. So, number of Marma tribe in Bandarban area must be lesser than 0.35 million which is much lesser than total number of slum dwellers in Dhaka city. To represent this large number of slum dwellers, sample size of slum dwellers is larger than Marma tribe. On the other side, in Bandarban area most of the paras consists only 10 to 20 households whereas in Dhaka city slums consists 100 to 1000 households. That's why number of para is more than number of slum. The main respondent was the head of the household. Except some questions most of the questions had been asked to head of the household. Only some particular questions had been set for every member of the household.

3.4 Sampling Techniques

While collecting data a particular technique has been followed that is purposive sampling. The area of slums and paras has been chosen purposefully on the basis of conveniency and accessibility. On the other hand household of respondent has been chosen on the basis of systematic sampling where every other a particular number of household has been selected. From three slums, Mirpur (Rupali Real estate) slum has 1000 household, so sample has been chosen from every after 10 household, and Uttarkhan slum has about 400 households, so sample has been chosen every after 5 household and lastly Rampura slum has about 60 households so here sample has been chosen every after second household. On the other hand in Bandarban area mostly paras have only 20 households. So, sample household has been chosen in systematic way which is like every after second household. So, in that way each para consist 10 sample household. Paras which have 30 households there sample has been chosen every after third household. This study has also followed multiphase sampling analysis as some questions from the questionnaire were for every household member and rest of the questions has been asked only to the head of the household who was the main respondent of this thesis.

3.5 Tools for Data Collection

Data has been collected by face to face interview with help of structured questionnaire. The questionnaire was pre-tested and then modified accordingly. This questionnaire mainly included those questions which were thought important and relevant for the topic. In the following section, information about variables (types, brief descriptions) is given.

3.6 Description of Questionnaire

Variables	
Independent Variables	**Dependent Variables**
Socio-demographic factors	Water borne diseases and other infectious diseases.
Healthcare facilities	
Lifestyles related to WASH practice (water, sanitation, hygiene)	

Socio Demographic Factors

This study has been conducted on particular group of people and the main purpose of this study was to know causes and consequences of their health situation and also to know the effect of various lifestyle related factors (social, economic) on their health condition. As independent variables -some socio demographic factors, healthcare facilities, and lifestyle related WASH practices have been chosen to analysis. Factors are— sex, education, occupation, expenditure, WASH practice system, health care services, and so on.

Sex- This study can find out which group is more vulnerable in terms of their WASH practice. Through frequency of sex analysis and their other practices we have to come to know that women are more likely to practice unhygienic WASH practices than men. So, now more attention needs to give on female group.

Education-Education is a great factor to gather any knowledge about hygienic practices. In this study most of the respondents were illiterate and from them most of them do not do hygienic practice.

Occupation- Throughout the study it has been found that those who have higher level job, like- army or teacher they are well known and aware about hygiene practices. Even they are in less number affected people by infectious diseases than people who are farmer or maid.

Expenditure- It needs to know how much every family needs to spend for monthly household expenses. Marma people have to spend more

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than slum dwellers every month. Marma people have to spend a particular portion of their income on their children's education which slum dwellers do not do. This practice has put effect on their life also. After visiting field it has been understood that Marma lead comparatively a standard life than slum dwellers.

Pattern of practicing hygiene water and sanitation system:

Water usage system- Water usage system has been analyzed as independent variable. Through the pattern we can come to know why or whether they are having any water borne diseases or not.

Sanitation system- Sanitation system is a very important factor which needs to be analyzed as independent variable. What type of sanitary latrine they are using; where they are disposing their stools and other garbage- these can give an idea about their sanitation practice system.

Hygienic practice- Most of the people know about importance of hygiene but they don't know about the process of practicing it. Lacking of proper knowledge and awareness can result many types of infectious diseases.

Infectious and water borne diseases:

Diarrhoea- Diarrhoea is loose, watery stools. If anyone has loose stools three or more times in one day then it can call as diarrhoea. Acute diarrhoea is diarrhoea that lasts a short time. Chronic diarrhoea is diarrhoea that lasts at least four weeks.

Cholera-Cholera is also a type of loose motion like Diarrhoea. It is an infectious and often fatal bacterial disease of the small intestine, typically contracted from infected water supplies and causing severe vomiting**.**

Typhoid-It is an infectious bacterial fever with an eruption of red spots on the chest and abdomen and severe intestinal irritation.

Dengue- Dengue is a debilitating viral disease of the tropics, transmitted by mosquitoes, and causing sudden fever and acute pains in the joints.

Chikungunya- Chikungunya is also a viral disease resembling dengue, transmitted by mosquitoes and endemic in East Africa and parts of Asia. Throughout the study this diseases has largest number of response.

Skin diseases-Different types of skin rashes and fungus can affect people if they do not use safe and hygienic water.

3.7 Methods and Data Analysis

As both qualitative and quantitative study has been done so for quantitative study different statistical analysis has been conducted by using SPSS software. For basic descriptive statistics frequency analysis has been carried out. To ensure the relationship between various dependent and independent variables bivariate-chi-square test analysis has been conducted. Different analysis can give different result. That's why to come up with solid evidence and to know actual relationship finally multivariable logistic regression analysis has been done. Through multivariable analysis we needs to know whether independent and dependent variables are significant and interconnected or not.

Data analyses have been conducted following the nature of the data on the basis of different methods. As here qualitative study also has been followed so, it needs to be descriptive - case study by using different source. Data has been collected through primary source that's why questions have been asked to the respondents' naturalistic observation and also in-depth interview by using tape recorder. Qualitative data has been analyzed through descriptive case study.

By using MS Excel software some graph has been constructed in this study.

3.8 Ethical Issues

In order to maintain the ethical issues, the researcher performed several activities. Some of them are given below:

- Before collection of data, approved letter of thesis has been taken from Social Relations Department of East West University.
- Before interview, each respondent had been informed thoroughly about the study aspects, purposes, duration of interview and data collection methods.
- Confidentiality of data and privacy of the respondents has been maintained strictly.
- Each respondent was informed that participation in the survey was voluntary and there was no penalty for termination during interview.
- They had the option to skip question(s) from the questionnaire.

Although written informed consent was available in the questionnaire, the researcher pointed all these points verbally to get verbal consent.

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Chapter - 4

Results

The results of the study are presented into various sub-sections. First simple analysis was performed to describe socio-demographic and WASH practices for the respondents and total household members through frequency. Then bivariable (cross-table) and multivariable analyses (e.g. multivariable logistic regression analysis) are performed to present major findings of the study.

Socio-demographic conditions

The socio-demographic information, based on respondents and total household members, are presented in Table 1. Most of the respondents were male in urban slums (64.0%) and female (53.0%) in Marma tribe communities. Very few households had a small family size ranging from two to seven. On an average every family had at least four members.

Table 1: Socio-demographic information of the respondents (N = 260) and total household members* (N = 888), Slum= 200, Marma= 60

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Average size of House hold member		4		3.7		4.7
Age: (N*)						
0-15	243	27.4	171	26.7	72	29.0
15-40	404	45.5	307	48.0	97	39.0
40-65	214	24.0	147	23.0	67	27.2
65+	27	3.1	15	2.3	12	4.8
Sex: ((N)						
Male	156	60.0	128	64.0	28	46.7
Female	101	38.8	69	34.5	32	53.3
Transgender	3	1.2	3	1.5	0	0.0
Education: (N)						
No Education	155	59.6	114	57.0	41	68.0
Primary	58	22.3	46	23.0	12	20.3
Secondary	47	18.1	40	20.0	7	11.7
Tertiary	0	0.0	0	0.0	0	0.0
Occupation (N):						
Business	19	7.3	16	8.0	3	5.0
Day laborer	24	9.2	14	7.0	10	16.7
Driver	2	0.8	2	1.00	0	0.0
Farmer	21	8.1	0	0.0	21	35.0
Housewife	5	1.9	0	0.0	5	8.3
Job	4	1.5	0	0.0	4	6.7
Jum farming	10	3.8	0	0.0	10	16.7
Shop keeper	25	9.6	18	9.0	7	11.6
Garment worker	47	18.1	47	23.5	0	0.0
Maid	59	22.7	59	29.5	0	0.0
Rickshaw puller	42	16.2	42	21.0	0	0.0
Watchman	2	0.8	2	1.0	0	0.0
Total cost per month (N*):						
TK. 1000-2000	3	1.2	3	1.5	0	0.0
TK. 2000-5000	164	63.0	164	82.0	0	0.0
TK. 5000-8000	35	13.5	24	12.0	11	18.3
Tk. 8000-12000	34	13.1	9	4.5	25	41.7
Tk. 12000-15000	24	9.2	0	0.0	24	40.0
TK. 15000+	0	0.0	0	0.0	0	0.0

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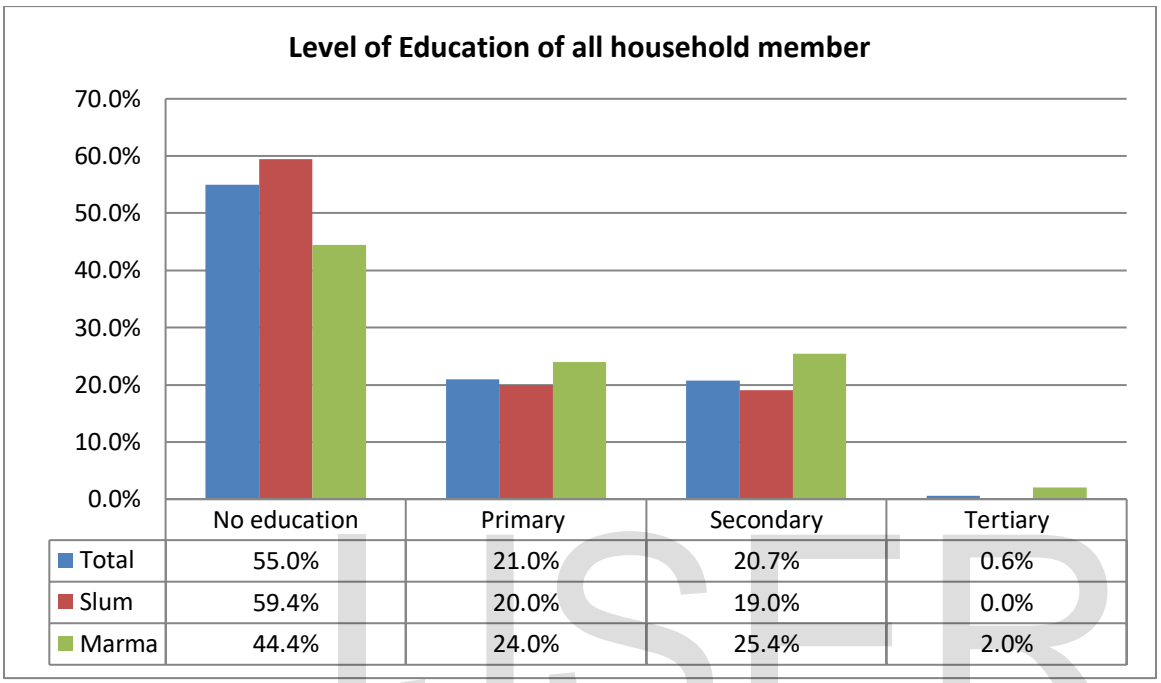
This table shows that in both communities the majority group of household members belongs to the middle age group of 15-40 years. Most of the respondents (N=260) were illiterate in both areas (slum 57% and Marma 68%). The three leading occupations were maid servant (29.5%), rickshaw puller (21%) and garment worker (23.5%) in slum areas and farmer (35.0%), day laborer (16.7%) and shop keeper (11.7%) in Marma community.

Figure 2: Level of education for all household members (N*=888)

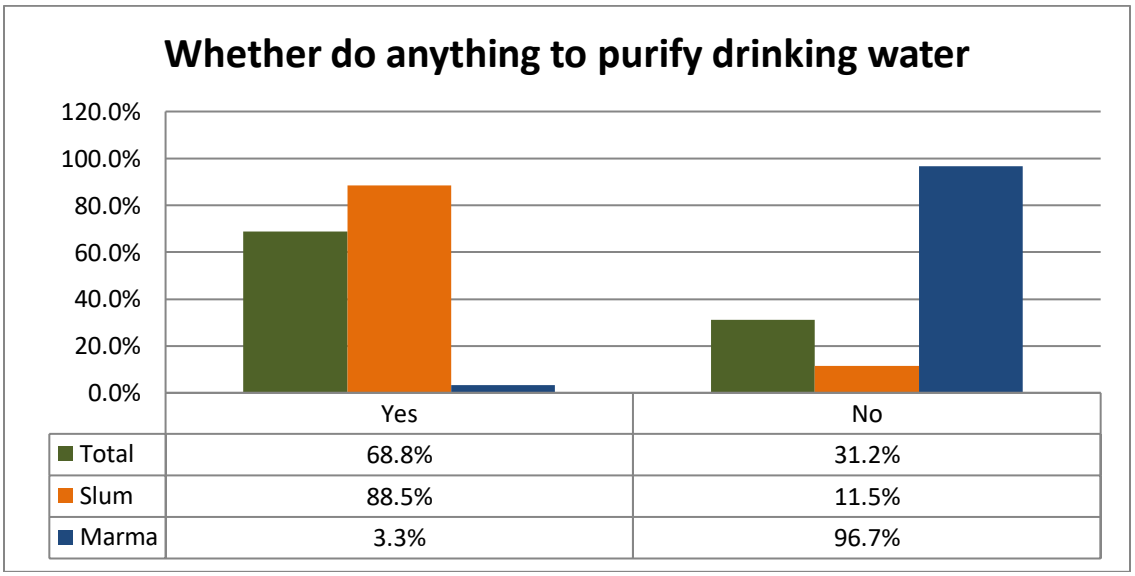


	No education	Primary	Secondary	Tertiary
Total	55.0%	21.0%	20.7%	0.6%
Slum	59.4%	20.0%	19.0%	0.0%
Marma	44.4%	24.0%	25.4%	2.0%

From the above graph we can see from total household member (N=888), about 24% Marmas are educated till primary level, whereas slum dwellers are 20% educated till primary level. In tertiary level from total tribal at least 2% are educated till tertiary level but any slum dwellers are not educated till tertiary level.

Sources and usages of water

Figure 3: Percentage of drinking water purification in both areas



	Yes	No
Total	68.8%	31.2%
Slum	88.5%	11.5%
Marma	3.3%	96.7%

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Table 2: Descriptive analysis of water sources and usages process in slum areas= 200 and Marma community= 60 (N=260)

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Waysto purify drinking water (Those who purify water):						
Boiling	96	53.6	95	53.7	1	50
Medicine	2	1.1	2	1.1	1	50
Purifier	81	45.3	80	45.2	0	0.0
Source of drinking water:						
Piped water outside dwelling	212	81.5	200	100.0	12	20.0
Tube well water	21	8.1	0	0.0	21	35.0
Surface water	0	0.0	0	0.0	0	0.0
Pond/Lakes/Tank	20	7.7	0	0.0	20	33.3
River	7	2.7	0	0.0	7	11.7
Source of water for cooking:						
Piped water outside dwelling	204	78.5	200	100	4	6.7
Tube well water	16	6.0	0	0.0	16	26.7
Surface water	2	0.8	0	0.0	2	3.2
Pond/Lakes/Tank	25	9.7	0	0.0	25	41.7
River	13	5.0	0	0.0	13	21.7
Source of water for washing clothes:						
Piped water outside dwelling	204	78.5	200	100	4	6.8
Tube well water	1	0.4	0	0.0	1	1.8
Surface water	7	2.7	0	0.0	7	11.7
Pond/Lakes/Tank	25	9.6	0	0.0	25	41.7
River	23	8.8	0	0.0	23	38.0
Source of water for cleaning utensils:						
Piped water outside dwelling	205	78.8	200	100	5	8.0
Tube well water	17	6.5	0	0.0	17	28.0
Surface water	2	0.8	0	0.0	2	4.0
Pond/Lakes/Tank	24	9.3	0	0.0	24	40.0
River	12	4.6	0	0.0	12	20.0

According to graph 2, drinking water purification was 88.5% in slum areas, which was only 3% in Marma community. Similarly according to Table 2, the two major ways of drinking water purification were boiling (53.7%) and used purifier machine (45.2%) in slum areas and in Marma areas only 2 respondents replied that they purify water in two ways which are boiling and through medicine. In terms of water usage system slum dwellers do all their work with piped/supply water (100%) whereas Marmas use different sources (Drinking water from tube well water=35%, cooking from tube well water=26.7%, washing clothe from pond/lake/tank=41.7%, cleaning utensils from pond/lakes/tank=40%).

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Sanitation Practice System

Table 3: Descriptive analysis of Sanitation Practice System (N=260) (Slum= 200, Marma=60)

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Whether share toilet:						
Yes	216	83.0	194	97.0	22	37.0
No	44	17	6	3.0	38	63.3
If yes, no. of households who used one sanitary:						
7	2	0.9	0	0.0	2	9.1
8	4	1.9	0	0.0	4	18.2
9	2	0.9	0	0.0	2	9.1
10	4	1.9	0	0.0	4	18.2
15	180	83.3	174	89.7	6	27.3
20	21	9.7	20	10.3	1	4.5
30	3	1.4	0	0.0	3	13.6
Types of toilet:						
Septic tank/ Modern toilet	6	2.3	6	3.0	0	0.0
Pit toilet/latrine	1	.4	0	0.0	1	1.7
Sealed/slap latrine	215	82.7	194	97.0	21	35.0
Open latrine	8	3.1	0	0.0	8	13.3
Hanging Latrine	29	11.2	0	0.0	29	48.3
Other	1	.3	0	0.0	1	1.7
Disposal of child's stool defecation:						
Open place	46	17.7	0	0.0	46	76.7
Nearby river/pond	200	76.9	194	97.0	6	10.0
Below tree	1	0.4	0	0.0	1	1.7
Dustbin	6	2.3	6	3.0	0	0.0
Other place	7	2.7	0	0.0	7	11.6
Disposal of regular garbage:						
Open place	48	18.5	1	0.5	47	78.3
Nearby river/pond	197	75.8	192	96.0	5	8.3
Below tree	1	0.4	0	0.0	1	1.7
Dustbin	7	2.7	7	3.5	0	0.0
Other place	7	2.8	0	0.0	7	11.7

Through the above data we can see that most of the households share one toilet (83%) and about 17% household do not share their toilet with other households. This practice is mostly common in slum area, because about 97% household in slum area share toilet with other households whereas 36.7% Marmas share one toilet with other households. The major number of sharing household is 15 (83.3%). Slum area people mostly use sealed/slap latrine (97%) but most of the Marmas use open latrine (48%). Practice of dispose regular garbage is also different between two areas. Slum dwellers mostly dispose their regular garbage at nearby river/pond (96%) but Marma tribes dispose their regular garbage at open place (78%).

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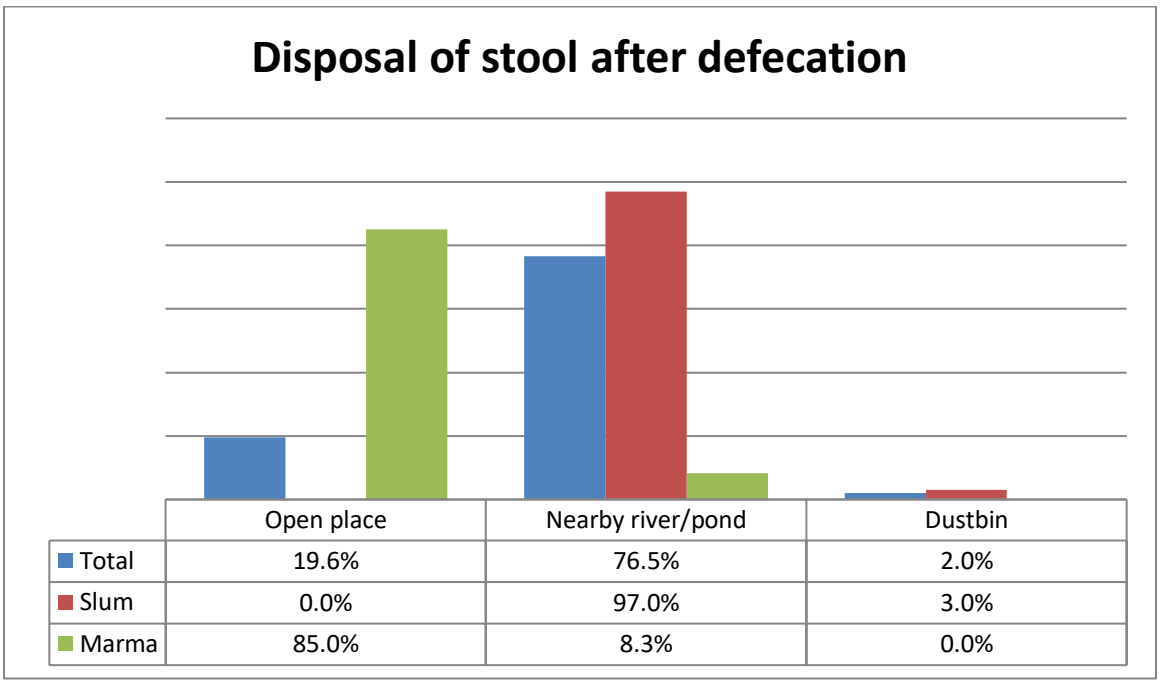
Figure 4: Dispose of stool after defecation.



From the above graph we can see that most of the Marmas dispose their stools whether at open place (85%) or nearby river or pond (8.3%). On the other side slum area people dispose defecation at nearby river/pond (97%) and dustbin (3%), some dispose below tree and other places. It can show that Marma people mostly dispose their stools at open place and slum dwellers dispose in nearby river or pond.

Hygienic Practice system

To get the actual result it needs to know how much they are doing hygienic practice in their daily life. Descriptive analysis has been run on whether they wash hand after defecation or before meal. They have been asked about using of methods while having menstruation, because it is a very important hygienic issue for girls.

Table 4: Descriptive analysis of Hygienic Practice system (N=260) (Slum=200, Marma=60)

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Frequency of washing hand after defecation:						
Yes	257	99	198	99.0	59	98.3
No	3	1.0%	2	1.0	1	1.7
If Yes,						
With soap	225	87.5	192	97	33	56
Without soap	32	12.5	6	3.0	26	44
Frequency of washing hand before having meal:						
Yes	248	95.4	193	96.5	55	91.7
No	12	4.6	7	3.5	5	8.3
If Yes,						
With soap	18	7	2	1	16	27.3
Without soap	231	93	191	99	40	72.7
Frequency of washing food before cook:						
Yes	244	93.8	196	98.0	48	80.0
No	16	6.2	4	2.0	12	20.0

Study is showing that in both areas about 99% people wash hand after defecation but from them about 87% use soap. In slum area about 97% people and in Marma community about 56% people use soap while washing hand. So, 44% Marma tribe does not use soap after defecation. In terms of washing hand before having meal – study is showing that about 99% slum dwellers do not use soap and about 72.7% Marma tribes do not use soap.

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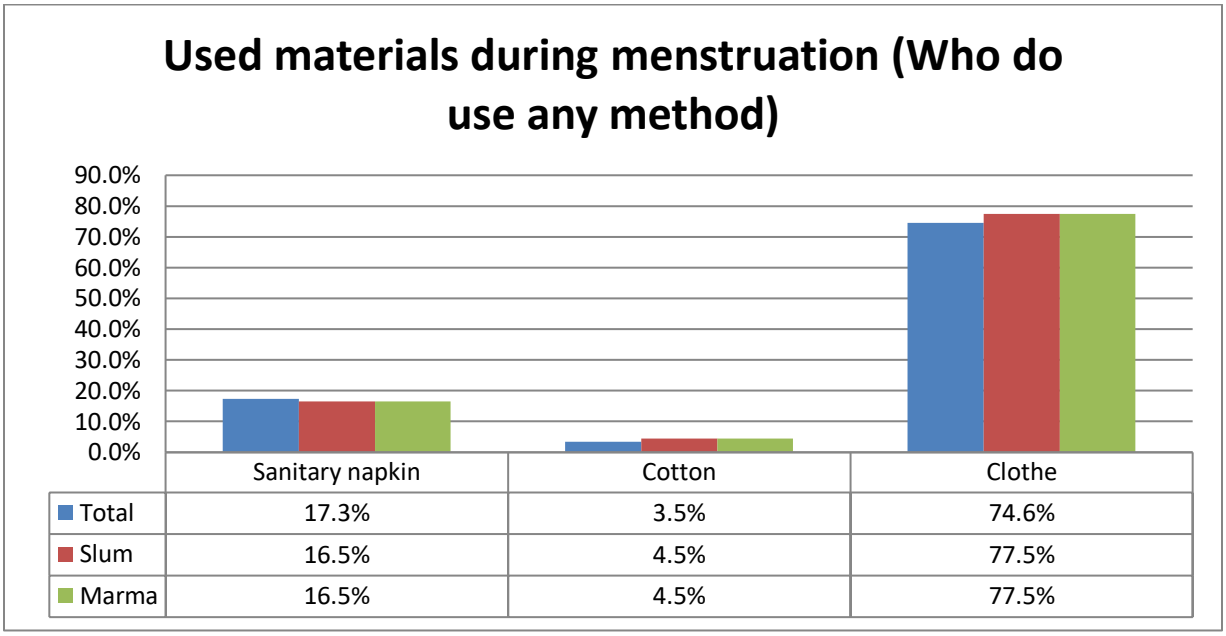
Figure 5: Use of methods during menstruation



Above graph showing that 16.5% slum dwellers use sanitary napkin, 4.5% use cotton and about 77.5% use clothe while having menstruation. On the other hand, about 16.5% Marmas use sanitary napkin, 4.5% use cotton and about 77.5% use clothe and few female members use other method rather than sanitary napkin, clothe or cotton.

Affected diseases relates with WASH system

Table 5: Whether suffer from any water borne/skin diseases since last one year (N=260) (Slum=200, Marma=60)

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Yes	194	74.6	166	83	28	46.7
No	66	25.4	34	17	32	53.3

Table 6: Frequency of diseases by which people got affected in last one year (N=260) (Slum=200, Marma=60)

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Types of diseases:						
Diarrhoea	15	7.7	6	3.6	9	32.1
Cholera	2	1.0	2	1.2	0	0.0
Typhoid	7	3.6	7	4.2	0	0.0
Dengue	29	15	26	15.7	3	10.7
Chikungunya	62	32	58	35	4	14.3
Skin Diseases	5	2.6	1	0.6	4	14.3

About 75% people got affected by water borne diseases or skin diseases. Through the above data it has been seen that about 83% slum dwellers and 46.7% Marmas got affected with water borne diseases. People who got affected Slum dwellers got affected with new upbringing disease which is 'Chikungunya' (35 %). On the other side in Bandarban area, Marmas mostly got affected with diarrhea (32.1 %). From total household members (N*=888) 378 people has affected with water borne or skin diseases, where 344 were slum dwellers and 44 were Marma tribes.

Health service centers and their facilities

Respondents had been asked about the quality and availability of health service facilities.

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Table 7: Descriptive analysis of Health service centers and their facilities (N*= 888)

Variables	Total		Slum		Marma	
	n	%	n	%	n	%
Visiting doctor for diseases:						
Diarrhoea	43	4.8	29	4.5	14	5.6
Cholera	12	1.4	12	2.0	0	0.0
Typhoid	25	2.8	24	3.8	1	0.4
Dengue	64	7.2	61	9.5	3	1.2
Chikungunya	186	21.0	176	27.5	10	4.0
Skin Diseases	19	2.0	13	2.0	6	2.4
Other	15	1.7	15	2.0	0	0.0
Availability of health service centers within one kilometer of home:						
Yes	241	92.7	196	98.0	45	75.0
No	19	7.3	4	2.0	15	25.0
Place of the health center:						
Same para/Moholla	233	89.6	199	99.5	34	56.7
Other area	12	4.6	1	0.5	11	18.3
City area	15	5.8	0	0.0	15	25.0
Quality of health services:						
Very good	2	0.8	0	0.0	2	3.3
Good	59	22.7	22	11.0	37	61.7
Preventable	196	75.5	175	87.5	21	35.0
Poor	3	1.0	3	1.5	0	0.0
Whether have any knowledge of respondents about important of safe WASH system:						
Yes	174	67.0	127	63.5	47	78.3
No	86	33.0	73	36.5	13	21.7

About 98% slum dwellers and about 75% Marma tribes replied that they have health service centers in same area. About 87% slum dwellers think that services of these health service centers are 'preventable'. On the other hand 61.7% Marmas evaluate the services of these health service centers as 'good'.

Chapter - 5

Bivariate& Multivariable Analysis

Bivariate Analysis: Cross table and chi square test

Socio-Demographical Study

Table 1: Crosstab between age group and level education

		No education	Primary	Secondary	Tertiary
0-15	**Slum**	46.7%	30.3%	23%	0%
	Marma	11%	51.5%	37.5%	0%
15-40	**Slum**	63.4%	19%	17.6%	0%
	Marma	46.3%	15.5%	33%	5.2%
40-65	**Slum**	65.8%	14.2%	20%	0%
	Marma	73%	16.5%	10.5%	0%
65+	**Slum**	100%	0%	0%	0%
	Marma	90%	10%	0%	0%

Table 2: Percentage of Dengue by areas

		Dengue		P value (.05)
		no	yes	.000
Area	Slum	90.3%	9.7%	
	Marma	98.8%	1.2%	

Through the result of cross tabulation between Area of respondent and percentage of Dengue patient we can see that 9.7% slum dwellers and only 1.2%Marma tribes got affected with Dengue. P-value for both results is .000 which defines that the relationship is significant.

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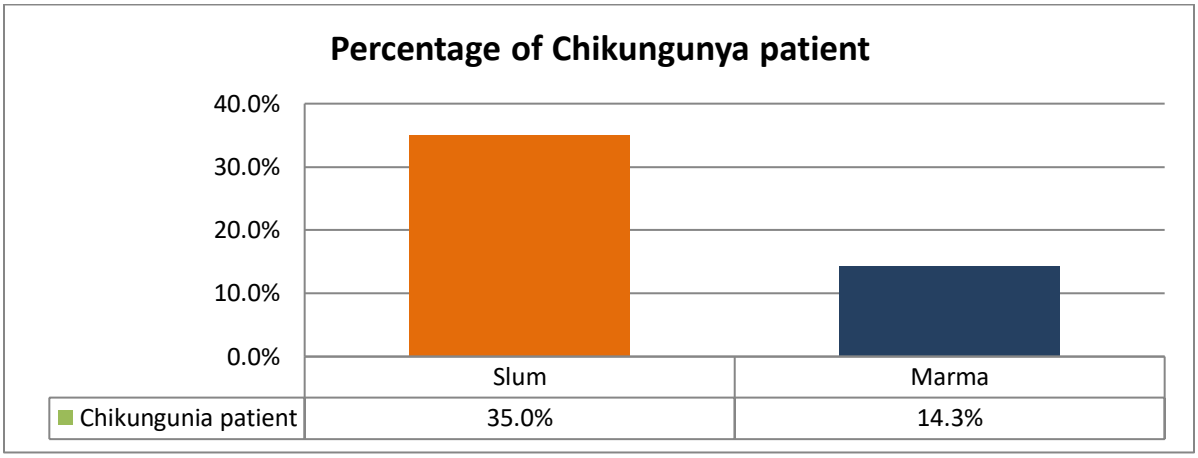
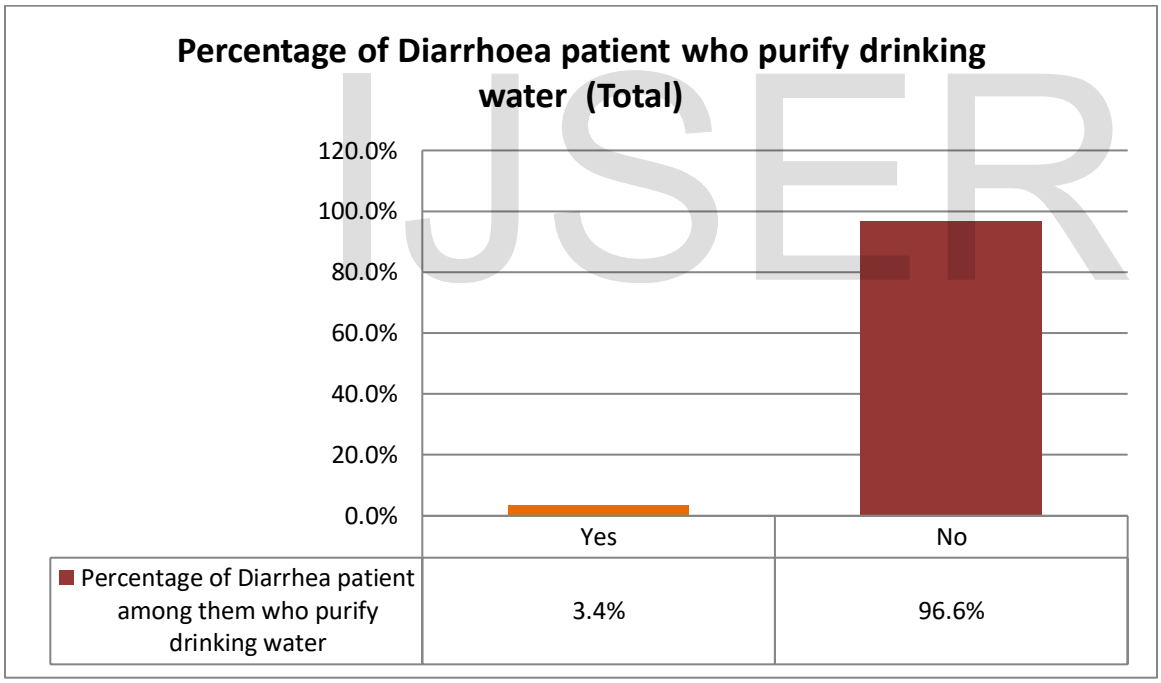
Figure 6: Percentage of Chikungunya patients by areas(N=260) (Slum=200, Marma=60)



Above figure gives us idea that from slum area about 35% people and from Marma area about14.3% people are affected with Chikungunya disease, else haven't affected.

Water Usage System

Figure 7: Percentage of Diarrhoea patient who purify drinking water by areas



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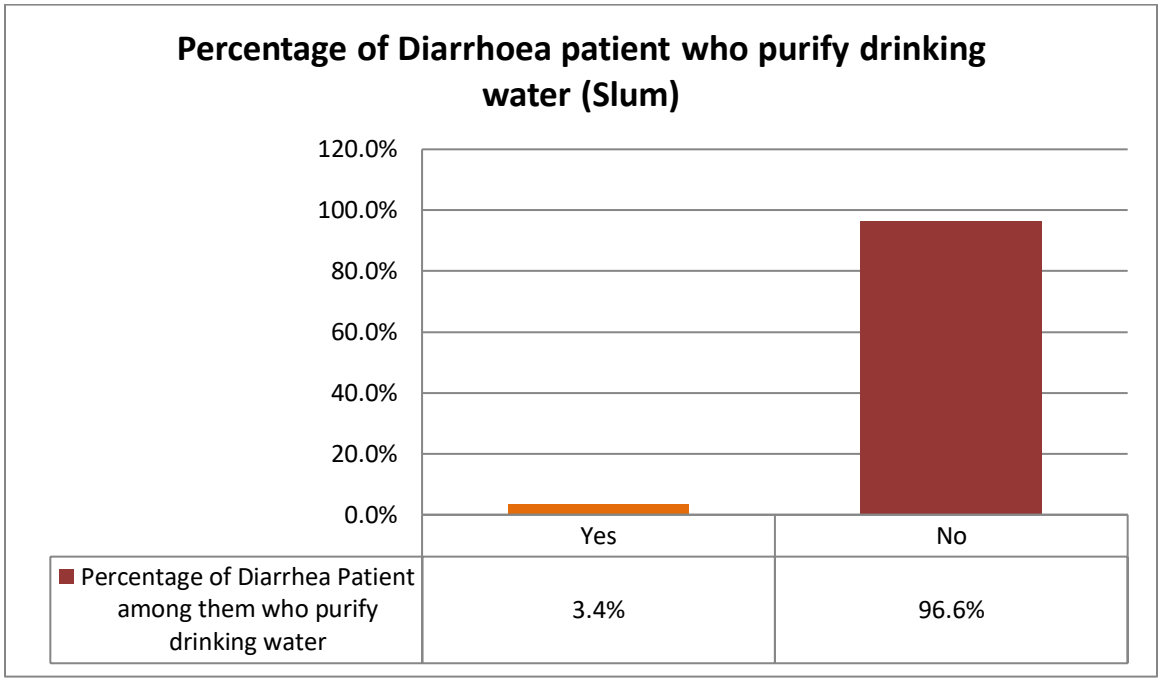

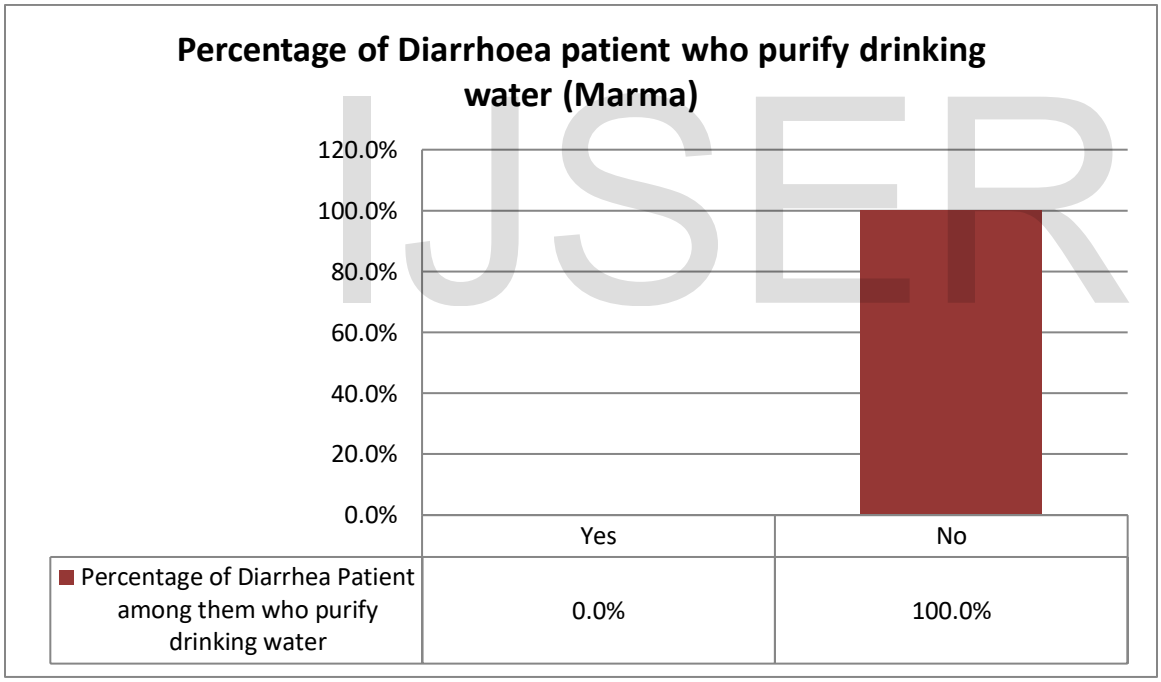

Respondent had been asked whether they do anything to purify their drinking water, then some of them replied positively and some negatively. Above table showing us that those who purify drinking water their chances of getting affected by diarrhoea diseases is only 3.4% In slum area those who purify water, among them only 3.4% people got affected with diarrhoea and Marmas who purify water among them 100% people, which is all of them does not affected with Diarrhoeal diseases.

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Sanitation Practice System

Table 3: Crosstab between disposal of stool & garbage and percentage of Dengue & Chikungunya patient.

Dispose of stool after defecation		Percentage of Dengue patient	P-value (0.05)
	Open place	6.0%	.490
	Nearby river/pond	13.0%	
		Percentage of Chikungunya patient	
	Open place	8.0%	.009
	Nearby river/pond	29.0%	
Place of regular garbage disposal		Percentage of Chikungunya patient	
	Open place	8.3%	.006
	Nearby river/pond	29.4%	

About 6% people got affected with Dengue who disposes their stool at open places and 13% people got affected who dispose their stool in nearby river or pond. About 29% people got affected with Chikungunya who dispose stool after defecation in nearby river or pond.

Hygienic System

Table 4: Crosstab of Knowledge of respondents about Hygienic practice

Variables		Use of methods during menstruation			**P-value (0.05)**
		Sanitary napkin	Cotton	Clothe	
Education level	**No education**	8.8%	2.2%	89.0%	.000
	Primary level	31.4%	6.5%	62.1%	
	Secondary level	32.6%	5.8%	61.6%	
Knowledge about the importance of hygienic practice	**Yes**	Percentage of Dengue patient			
	No	4.6%			
		24.4%			
		Percentage of Chikungunya patient			
	Yes	21.3%			
	No	29.0%			
Knowledge about the importance of hygienic practice		Percentage of patient affected with any water borne or skin diseases			
		Yes		No	
	Yes	71.3%		28.7%	
	No	81.4%		18.6%	

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Relationship between education level and use of methods during menstruation has highly significance (.000). The people who have no education, from them about 89% people use clothe 2% use cotton, and 8.8% use sanitary napkin. Crosstabs result has shown that the higher their education level lesser the percentage of clothe user. Another result has shown that about 71.3% people are affected with water borne or skin diseases who have knowledge about the importance of safe WASH system.

Table 5: Crosstab of awareness of respondents about hygienic practice.

Knowledge about the importance of safe drinking water		Stay clean	Boil water	Keepwater fresh
	Yes	49.4%	12.6%	38.0%
Knowledge about the importance of safe sanitation practice		Stay clean	Use soap after defecation	Use fresh and modern sanitary
	Yes	60.0%	8.0%	32.0%
knowledge about the importance of safe hygienic practice		Stay clean	Fresh environment	Take fresh and nutritious food
	Yes	66.0%	3.0%	31.0%

Above data can define about previous table result (table- 4). People who have knowledge about fresh WASH system among them about 49% know that they have to stay clean in terms of safe drinking water, only 12.6% know about the importance of boiling drinking water. Only 8% know about the importance of using soap after defecation and 32% aware about fresh and modern sanitary and only 31% aware about the importance of taking fresh and nutritious food.

Table 5.1: Crosstab of Awareness of respondents about Hygienic practice **(Slum area).**

Knowledge about the importance of safe drinking water		Stay clean	Boil water	Keep water fresh
	Yes	55.1%	13.4%	31.5%
Knowledge about the importance of safe sanitation practice		Stay clean	Use soap after defecation	Use fresh and modern sanitary
	Yes	57.5%	10.2%	32.3%
knowledge about the importance of safe hygienic practice		Stay clean	Fresh environment	Take fresh and nutritious food
	Yes	68.5%	3.9%	27.6%

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Table 5.2: Crosstab of Awareness of respondents about Hygienic practice **(Marma area).**

Knowledge about the importance of safe drinking water		Stay clean	Boil water	Keep water fresh
	Yes	34%	10.6%	55.4%
Knowledge about the importance of safe sanitation practice		Stay clean	Use soap after defecation	Use fresh and modern sanitary
	Yes	66%	2.1%	31.9%
knowledge about the importance of safe hygienic practice		Stay clean	Fresh environment	Take fresh and nutritious food
	Yes	44.7%	15%	40.3%

About 68.5% slum dwellers and 44.7% Marmas have knowledge that they should stay clean regarding safe hygienic practice. 10.2% slum dwellers and only 2.1% Marma tribe have knowledge about the importance of wash hand with soap after defecation.

Health Service Facilities

Table 6: Crosstab between type of treatment for different diseases and their costs

		Health centre	Doctor	Nurse/ paramedics	Pharmacy	Kabiraj	Self-medication	**P-value (0.05)**
Diarrhoea	0-200	13.4%	0.0%	0.0%	73.3%	0.0%	13.3%	
	300-500	33.3%	0.0%	0.0%	66.7%	0.0%	0.0%	
	500-1000	60.0%	0.0%	40.0%	0.0%	0.0%	0.0%	**.001**
	1000-5000	60.0%	0.0%	0.0%	40.0%	0.0%	0.0%	
	5000+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Cholera	0-200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	300-500	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	500-1000	100%	0.0%	0.0%	0.0%	0.0%	0.0%	
	1000-5000	100%	0.0%	0.0%	0.0%	0.0%	0.0%	
	5000+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Typhoid	0-200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	300-500	100%	0.0%	0.0%	0.0%	0.0%	0.0%	
	500-1000	92.3%	7.7%	0.0%	0.0%	0.0%	0.0%	**.618**
	1000-5000	100%	0.0%	0.0%	0.0%	0.0%	0.0%	
	5000+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Dengue	0-200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	300-500	23.0%	15.5%	0.0%	61.5%	0.0%	0.0%	
	500-1000	72.7%	27.3%	0.0%	0.0%	0.0%	0.0%	**.000**
	1000-5000	97.3%	0.0%	0.0%	2.7%	0.0%	0.0%	
	5000+	100%	0.0%	0.0%	0.0%	0.0%	0.0%	
Chikungunya	0-200	0.0%	1.3%	0.0%	94.7%	0.7%	3.3%	
	300-500	13.6%	9.0%	0.0%	77.4%	0.0%	0.0%	
	500-1000	33.3%	0.0%	0.0%	66.7%	0.0%	0.0%	**.000**
	1000-5000	0.0%	75.0%	0.0%	0.0%	0.0%	25.0%	
	5000+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

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Skin diseases	0-200	0.0%	0.0%	0.0%	33.3%	66.7%	0.0%	**.000**
	300-500	0.0%	100%	0.0%	0.0%	0.0%	0.0%	
	500-1000	90.0%	0.0%	0.0%	0.0%	10.0%	0.0%	
	1000-5000	100%	0.0%	0.0%	0.0%	0.0%	0.0%	
	5000+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Through the above data it has been seen that relationship between cost of the diseases and type of treatment has significance. People who suffer with Diarrhoea disease from them about 73% people has to pay 0-200 taka by taking treatment from pharmacy and 60% spent 500-1000 through health centers. 94.7% Chikungunya patient spent 0-200 taka by taking treatment from pharmacy and 77.3% Chikungunya patient spent 300-500 taka by taking treatment pharmacy.

Multivariable Binary Logistic Regression Analysis

Multiple binary logistic regressions have been run for this study to see the actual relation between binary or dichotomous dependent variable and multiple categorical or continuous independent variables. This analysis is the predictive analysis.

Dependent variable: Percentage of affected people with different kinds of water borne or skin diseases.

Socio-Demographical study

Table 1: Logistic regression analysis between patient of affected diseases and socio-demographical terms.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Sex	-.508	.313	2.646	1	.104	.601	.326	1.110
Occupation with higher category	-.124	1.172	.011	1	.916	.883	.089	8.790

Above table showing us that from the respondent's area, male group of population are less likely to have infectious diseases than female group of people. Male has about 40% lesser chance to get affected. Occupation has been categorized in terms of higher to lower category. Those who do high ranking job or those are army or student or teacher they have 12% less chance to get affected with diseases than other group of people, like- farmer, jum farming, rickshaw puller, maid, and so on.

Water usage system

Table 2: Logistic regression analysis between patient of affected diseases and their water usage system.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Whether make drinking water safe	-.827	.416	3.949	1	.047	.437	.193	.989
Main source of drinking water	-1.093	.463	5.573	1	.018	.335	.135	.831

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We can see that those purify the drinking water they have 56% less chance to get affected with infectious or water borne diseases than those who do not purify. Main source of drinking water has been categorized into two groups, which are piped/supply water and natural source of water, like- river, pond, lake, and so on. Through the logistic regression analysis it can be seen that people who use piped water they have 66.5% lees chance to get affected than natural source user. Both are the relationship showing significance (.047 and .018).

Sanitation Practice

Table 3: Logistic regression analysis between patient of affected diseases and their sanitation practice system.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Way of washing hand after defecation	-1.791	.402	19.871	1	.000	.167	.076	.367

Logistic regression analysis can clearly show that way of wash hand after defecation has deep significant (.000) relationship with the diseases. Those who wash hand with soap after defecation they have 83% less chance to have infectious diseases .

Hygienic practice system

Table 4: Logistic regression analysis between patient of affected diseases and Hygienic Practice.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
No of household who use one sanitary	-.126	.073	2.944	1	.086	.882	.764	1.018
Way of washing hand after defecation	-1.512	.617	6.007	1	.014	.220	.066	.739

Above analysis can be define in a way that the lesser the number of household who use one sanitary the lesser their chance to get affected with infectious diseases; At least 12% less chance to get affected with infectious diseases. Here also we can see about the significant (.086 & .014) relationship between way of washing hand after defecation and diseases.

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WASH System

Table 5: Logistic regression analysis between patient of affected diseases and WASH system.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Number of household who use one sanitary	-.100	.086	1.332	1	.248	.905	.764	1.072
Way of washing had after defecation	-1.884	.906	4.322	1	.038	.152	.026	.898
Make drinking water purify or not	-.513	.677	.574	1	.449	.599	.159	2.257
Wash food before cooking	-2.388	1.132	4.449	1	.035	.092	.010	.845
Sex of respondent	-.740	.465	2.529	1	.112	.477	.192	1.188

Above analytical table can define the hypothetical chance of getting affected with diseases in terms of different independent variables. Male group of people have 52% less chance to get affected. People who follow safe WASH system, they are likely to have less chance to get affected with diseases. Like, who wash food before cooking they have 91% less chance, then who purify the drinking water they have at least 40% less chance. Though some of the relationship between variables are not showing significance but their odds ratio are meeting the target of predicted overview which can consider as important fact of this paper.

Chapter - 6
Discussion

Bangladesh has made significant improvement in various sectors particularly in socioeconomic and health sectors since its independence in 1971 (Khan et al, 2011). These improvements are clearly revealed at the aggregated level by various indicators like declining poverty, infant and child mortality, increasing life expectancy, water, sanitation and healthcare development throughout the country. However, group-specific analyses indicate that such improvement varies remarkably across geographical areas and societies. Still a large number of groups stay in socioeconomically and geographically challenging situations. Urban slum dwellers and Marma tribe communities are two vulnerable groups who are socioeconomically and geographically disadvantaged and are at higher risk of suffering from infectious diseases due to poor socioeconomic, lifestyles and environmental conditions including limited facilities, knowledge, awareness and practice for safe WASH system.

This study has been conducted to perform comparative analysis of WASH system between Marma tribe in Bandarban district and urban slum dwellers in Dhaka. The major aims of this research were to report the prevalence of safe WASH practices by two groups and how their WASH practices are associated with infectious and water borne diseases. Before starting data collection, the sample size for each area has been determined purposefully focusing on accessibility to the study area, cost and time. Then some particular villages (locally called *paras*) of Marma tribes and some slums in Dhaka have been selected for data collection. A sampling frame of households for each village or slum has been prepared and then selected households based on

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systematic sampling have been chosen for collecting data using pre-tested questionnaire. The main respondent of the questionnaire was normally the head of the household. After collecting data, SPSS software and Microsoft office Excel were used to analyse them. Through this study I have found out that both areas are relatively vulnerable in terms of their hygienic practice system. WHO report has reported about sex ratio of Bangladesh, and it says that this country has 100.3 male against 100 female. In this study also we have seen that, from slum area there are 64% male and 34% female. As main respondent of this study was head of household, so, this percentage has been found on the basis of that. According to Marma's matriarchal culture, I have found 46.7% male and 53% female is head of the household.

According to the findings of my research, both urban slum dwellers and Marma tribes minimally practice safe WASH system in their daily lives. Their water usage system, sanitation practice and all other hygienic practices often do not meet safe WASH system. Their living arrangement and income indicated poor conditions. For example, in a tiny little room many people are staying together. They are also sharing toilet which is mostly under-developed and unhygienic. It has been found that in slum area one toiletwas used by 15 (on an average) households. From these households of slum area it has been found out that a large portion of people are mostly uneducated and having limited knowledge about safe WASH practice due to their poor socio-economic conditions. It has also been found that they are very versatile in terms of their occupation. On the basis of geographical condition and socio-cultural issues they do different jobs. For example, Marmas do jum (Any type of farming which used to be done at hilly area not on low land area) farming as it is one of the main source of their economy which cannot be seen in slum area of the city. Jum farming can only be done in hilly areas but not in the city like Dhaka (without hilly part). Many slum dwellers are garment worker as urban areas are mostly industrial based.

Due to geographical condition Marma community generally spend more money per month to maintain their livelihoods than slum dwellers. Most of their daily essential products including some food items cannot be produced or easily get in hilly areas. So, they need to travel far to collect them, which results- extra transport cost and time. My study has shown that comparatively slum area people are more educated than Marma tribe, because I have found out that 'No education' rate of head of the respondent's at slum area is about 57% and at Marma community is about 68%. It has been found out that literacy rate has been increased from 2007 to 2016 which is 46.66% to 72.76% (Unesco Institute for Statistics report, 2016). This rate is also true for this study also, because through data I have found out that though most of the elderly Marma people are illiterate but now their children are getting educated and their literacy rate is also getting higher. They have to spend a large portion of their income for their children's education due to lack of facilities as compared to slum dwellers. Although education is important factor to increase knowledge, awareness and practices of the safe WASH system, the education rate is not satisfactory in Marma community and should be improved. It has been also found that most of the household works are done by female members though head of the household is male. Females are less aware about their health conditions or hygiene that promotes their health. For instance, during their menstruation periods most of them use unhygienic clothes. Moreover, they cannot drink enough water and cannot get enough chance to become fresh due to their busy family issues.

There is a common proverb in our societies called "Water is life". This statement clearly signifies the huge importance of safe water. If someone sufficiently drinks safe water, he/she can protect himself/herself from dehydration. It can also reduce the chances of many diseases like water-borne and skin diseases. In contrast, if someone drinks unsafe dirty water, he/she can experience many diseases like diarrhoea, cholera, eczema, and so on..Water is used for other purposes such as for washing utensils and clothes, cleaning hands and mouth, and so on. Irrespective of the purposes of water uses, water has to be safe, fresh and purified. Everybody should take some actions to make the drinking water purified before drinking. Other water-related actions of daily lives (such as washing hands and utensils) should be implemented with fresh and safe water. Unfortunately, available water in both areas are limited and suffer from poor quality. However, this problem is more severe in Marma community. Most of Marmap eople drink water from natural sources like rivers, ponds or tube-wells, and lakes which are unhygienic and contaminated. They also perform various activities such as cleaning clothes, utensil or other works using water from ponds or lakes..It is also noticed that they disposed their used/dirty water to the nearby rivers or ponds.

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As a result, the water becomes more contaminated and increases the chance of water-related diseases. Since most all the Marma people do not boil or do anything to make drinking water safe, they generally suffer more from diarrhoeal diseases than slum dwellers in Dhaka. Practice of drinking water purification is very rare in Marma area, which is only 3% but about 97% slum dwellers purify water. It has been found out that in slum area those who purify water among them only 3.4% have suffered with diarrhoea and in Marma area those who purify water among them no one has suffered with diarrhoea. Rate of diarrhoea diseases is higher in Marma area than slum area and it has caused due to their practice of unpurified water drink. Around 45000 children die due to diarrhoea disease every year and contaminated drinking water is one of the main causes of this disease (WHO report, 2018).WHO has found out that this disease is mainly a symptom of infection that caused by contaminated water. This rate should reduce as soon as possible through safe WASH practice.

Like water, the global sanitation problem is huge. The MDG sanitation target, to halve the proportion of people lacking access to improved sanitation by 2015, is seriously off-tracked. About 2.5 billion people had limited access to basic sanitation in 2015 (Eid, U. (2015, January 21). The overall sanitary system in both study areas is under developed and requires urgent attention. Most of the survey populations use slap latrine which is generally open. When the respondent was asked to report about places for discharging their stools and other garbage, they replied that mostly it goes into the near riverside areas. Some people have even said that they use these contaminated water to take bath and wash their clothes and utensils. Briefly, the overall sanitation system in the study areas is highly unsafe and unhygienic for the population. Sharing toilet with other households is very common practice mostly in slum area. Study has revealed that, 97% slum dwellers and 36.7% Marma tribes share toilet with other households. Around 40% of all latrinesin Bangladesh has classified as unimproved (The World Bank report (2016). From my study it has shown that, both slum and Marma area's people do not use modern toilet as after study it has shown that 97% slum dwellers use sealed/slap latrine and 48% Marma tribes use hanging latrine. Both systems are not hygienic at all, because sewerage system of these types of latrine is not well developed. After research it has found out that only 18% of the city got improved sanitation system (The World Bank, 2016). Comparatively Marma population use personal washrooms more, than share it. Mostly they use sealed or slap latrine and another second large amount is open latrine which is used by Marmas. Disposal of stool or other garbage's done mostly in nearby river or pond by slum dwellers, but Marmas mostly dispose it in open place. Practice of dispose garbage's or child's stool in dustbin is very much rare.

Slum area people have only one wash room for many households. They do not clean those washrooms at all and even those are not modern. Sanitation makes a positive contribution in family literacy. According to a UNICEF study, for every 10% increase in female literacy, a country's economy can grow by 0.3%. Thus, sanitation contributes to social and economic development of the society. Improved sanitation also helps the environment. Due to lacking of proper education and knowledge regarding developed sanitation system, many slum dwellers and Marma tribe has to suffer from many infectious diseases. They do not clean the latrine properly at all which pollutes environment as well as put effect on health condition of people. Marma tribes are not aware about fresh environment and this has been proved when I have found out about the rate that says- about 76.7% tribals dispose child's stool at open place. Germs of those stools pollute the air and increase risk of infectious diseases like – diarrhoea and skin diseases. World Bank Report (2016) also has suggested eliminating the practice of open defecation to reduce the rate of Diarrhoeal disease.

Everyone should have knowledge regarding safe WASH practice as it is very important for better life. Practicing hygienic WASH system really need for everybody. From the study it has been shown that almost everybody wash hand after defecation but everybody do not use soap for that. From study data analysis we can see that only 10.2% slum dwellers and only 2.1% Marma tribes have awareness about the importance of using soap after defecation, which rate obviously should increase. Even most of them wash hand before having their meal but they do not use soap; and this view is same in both areas. While asking them about this, it has been seen that they even does not think this as wrong practice. And to me that's the main reason of their bad health condition, that they mainly do not have awareness. Female member of both Marma tribe and urban slum dwellers use clothe mostly during their menstruation which doesn't even get dried up in sunny weather.

In our daily life style we tend to do lots of things which are not hygienic and also not good for our health. We have fast

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food mostly which really doesn't good and known as junk food. Whenever we stay outside of home we eat food without washing our hand and even without washing the fruits we just directly eat. Even if we are educated person and know about the importance of hygienic system, we do these things. Urban slum dwellers are mostly uneducated and they do not have that much knowledge about the importance of hygienic practice. The place where they live those are not clean and fresh at al. As they are not using soap or any kind of hand sanitizer, the germ exists in their body and it get into their stomach with food.

Unhygienic WASH practices can affect people with many types of diseases. These diseases are mostly infectious which contain virus even. Unclean water usage can cause water borne diseases and skin diseases also. Throughout the study it has been found that mostly urban slum dwellers got affected with diseases than Marma tribe.

Diarrhoea is a symptom of instinctual tract infection which results due to bacteria. Bacterial disease mostly produces and spread by water. Drinking unsafe water and use unclean water can cause infectious disease in human being's body.

Unhygienic, damn, unclean environment can cause production of mosquitoes. Mosquitoes mostly like to stay in dark areas, in open water pots, and in sewerage, and so on. Slum dwellers mostly stay in these types of places. Their house, sewerage system, and drinking water source everything situated in same area. Their sewerage system is not developed at all; in fact their garbage cannot pass easily. So, those get overflowed. These all things caused birth of infectious mosquitoes. One emerging diseases – 'Chikungunya' last year spread significantly in urban areas. Slum dwellers have also got affected with this disease about which I have come to know through analysis of my study.

Slum area people stays in very congested, dark, muddy and unhealthy situation. In one room about 6-7 person stays. Their environment of living place is not clean at all. Most of them stay near drainage system. Mosquitoes always roam around there. Last year one emerging diseases which named Chikungunya has affected many people. Throughout the study it has been found out that Chikungunya is a leading disease among the selected areas. Last year most of the people got affected by Chikungunya which results due to a kind of infectious mosquito. Around 9 lack. (5% of total population of Dhaka city) people got affected with this infectious disease (ProthomAlo, 18th July, 2018). Throughout this study I have also found that the higher percentage of respondent got affected with Chikungunya. They also got affected by other diseases also, like- Dengue, Diarrhoea, skin diseases, and others.

This result does not meet the national level result. In national level most leading cause is Diarrhoea. But Diarrhoea is very common diseases now and now a day everybody knows about it and they know a minimum level of primary treatment for it. But in this paper people of selected areas has informed that they suffered more with Chikungunya in last one year. In terms of national level it can differ. Cholera or Diarrhoea these are age old disease. Although its incidence is declining and new diseases such as Chikungunya or Dengue are emerging. Moreover this study has been conducted with selective sample which cannot represent whole nation. Because in national level way of practicing WASH system is different in terms of their knowledge, their geographical condition, their socio-economic condition, and so on. Diarrhoea is observed nationwide while Chikungunya is mostly centered in urban areas. Basically what is true for the whole is not true for selective areas or persons. This is call ecological fallacy.

These things happen because of their lacking of proper knowledge and especially lacking of their awareness about being safe and clean. Through the statistical analysis it has been showed that most of the infectious disease affected people have knowledge about cleanness but they do not know the actual way of being clean. There are four steps theory in medical sociological terms.

Those are-

1. People who do not have knowledge and awareness.
2. People who do have knowledge but do not have awareness.
3. People who do not have knowledge but have awareness of being healthy
4. People who have both knowledge and awareness.

So, in my study respondent's condition is second one, which says that they have knowledge but they are not aware about their safety.

Now technology is being developed and it is making people's life easier. Most of the respondents reply positively about health service centers. Most of them replied that services of health service centers are at least preventable and to them that's the main fact. They are aware about their health issue and that's why they go and ask for treatment in hospitals or

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to doctor or to pharmacy for any serious diseases like- Diarrhoea, Chikungunya or Dengue. Most of them know about the importance of safe WASH system through different types of source, like- health service provider, community clinic, advertisement, TV show or books, and mainly from neighborhoods.

Though most of them have knowledge about safe WASH system but most of them are not aware about the procedure of safe WASH practice. Most of them know that they have to stay clean but only few practices and know about importance of boil drinking water, wash hand after defecation and even fresh environment.

Health sector facilities are getting developed day by day. In most of the para/moholla a minimum level of services are being provided. In Bandarban district, most of the respondents informed that there were health service centers in same para of the respondent's house or in other para. People agreed to go to those places for seeking treatment. But mostly they visit doctors and take medicine. On the other side they do own medication also. Mostly they do this because expense of treatment in health service are more than private doctor's treatment or own medication. Urban slum dwellers not even visit any health service centers if they do not feel that much urgent.

In my study people of both areas are socially as well as economically challenged. Their lifestyle is like 'hand to mouth'. So, their main focus is just how to arrange food for themselves and their family. It is totally a rare practice for them to think or aware about the safety of their health condition in terms of their lifestyle. They are mainly fond of some basic needs like- food, clothe and shelter. It won't make any difference in their life style situation if they themselves do not grow awareness about safe WASH practice system. We need to make them understand that, it is one of the main issues which they obviously need to know for their good health condition. If they can feel that these regular WASH practices are interrelated with their well-being, then they would understand the importance. It is actually a combination of understanding and awareness and both need to be build up in a proper way.

After over viewing the whole study we can say that, Marma tribes are more vulnerable than slum dwellers in terms of 'No education rate', 'Safe drinking water', 'Sanitation practice system', and also their awareness regarding safe WASH practice. Compared to national level statistics it can say that both areas are vulnerable. In Marma area we have found that due to unsafe drinking water and unhygienic sanitation system, they have to suffer with Diarrhoea more than slum dwellers. On the other hand till now slum dwellers have suffered with Dengue and Chikungunya more, than Marma tribes because of their unhygienic living condition. We can say that, it does not matter whether they are staying in urban area or rural eco-friendly area; rather it is a matter of unprivileged community who are vulnerable in every sector. Basically we can say that it does not matter that two study areas are belongs from two different areas; rather it's a matter of their socio-economic condition, that makes their life vulnerable.

Limitations:

While doing any kind of study it is common to face some limitations which I have also faced while I was working on this paper. As I was doing Intern at that moment so, time was an important issue for me. It was so difficult for me to manage time to go to study area and collect data. Same reason has not let me completed the paper within due date. Another challenge was lacking of participatory and active response of every respondent. Usually I went to collect data at day time when most of the households were at outside for their daily work. So, I had to wait for long or sometimes left that household without taking interview. I have also faced problem with respondent's biased answer. Some of them have followed other's answer and some have tried to choose the better option. Limited financial support was one of the main causes in this thesis work. As a student, it was really difficult for me to arrange financial support for collecting data and other expenses.

Chapter - 7

Conclusion and Recommendation

Conclusion

Knowledge about safe water, sanitation and hygienic system is limited among Marma tribe and urban slum dwellers. Most of them know that everybody should practice safe WASH system but they don't know the ways to do. This situation is clearly revealed when they said that they do not boil or do anything to make their drinking water safe. Even their sanitation system is not well developed though they were complaining about the sewerage system. Many female still use clothes while having menstruation and these materials

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get dried up in dark and unclean places. In our country tribals are known as minority group. So, in terms of other group of people their condition and situation is way much miserable in terms of their education, career, cultural and language issue. On the other hand slum dwellers were already led a traumatic situation from their origin. They were not happy at their origin and that's why they have moved to other place but throughout the study it seems that they are not even in a good condition at their destination which known as urban slum. To get a better life they come to city area, but it is their bad luck that they cannot access proper information and gather proper knowledge about the current situation of job market or about living accommodation in city area. Because of their lacking of knowledge they have to suffer a lot. Here they cannot get a developed housing system, like- proper sanitation, fresh drinking water, hygienic room and toilet, and so on. We only give our focus on large city area, but we should look after on other small regions also. We need to do lots of developmental work in hilly areas to make tribal's life more smooth and productive and also we need to check why numbers of slum dwellers are increasing day by day. Government should take some initiative so that they can get a way to stay in their own region. If they can get to do work for their bread and butter then they wouldn't come to one particular city area. It could reduce their unhygienic practice of WASH system also. They are practicing very unhygienic sanitation and unsafe usage of water system; although they replied that they know about the importance of safe drinking water and other hygienic practices. The findings of this research clearly suggest that their awareness regarding safe WASH system should be immediately improved by relevant stakeholders. Economical help and social awareness can be a great source of improvement.

Recommendation

It is not possible to develop any group of people within a short period of time. Every nation need some time to achieve their target. But to achieve anything we have to take some basic initiatives.

On the basis of my review of literature and practical experiences, I recommend following strategies to improve the overall situation of WASH system among the study populations.

i. Provide health education about safe WASH by the concerned authorities working in the study areas.
ii. Ensure arsenic and contaminated free drinking water for all by Governmental authoritative member.
iii. Allocate special funds for improving water, sanitation and drainage system in the study areas.
iv. Need to ensure free monthly health care service for Adolescents and reproductive women in terms of sanitary napkin and sanitation related other hygiene kit.
v. To ensure sustainable and safe sanitation with proper implementation of the management services in every public spaces for – women, children and handicaps.
vi. Create social awareness for improving water, sanitation and other environmental services in the study areas.
vii. Further epidemiological studies based on sound methodologies and study designs should be conducted to gain further knowledge about risk factors of their common health problems.

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Study Area:

Urban Slum

Marma Community