Study on Water Uses Pattern in an Urban Slum of Dhaka City

MD Atai Rabbi

MD. Mamun Parvez

Department of Civil and Environmental Engineering
Islamic University of Technology
Gazipur, Bangladesh

October 2012

Study on Water Uses Pattern in an Urban Slum of Dhaka City

A thesis report submitted to Department of Civil and Environmental Engineering, Islamic University of Technology (IUT), in partial fulfillment of the requirements for the degree of Science in Civil and Environmental Engineering.

Prepared by

MD. Atai Rabbi (08 54 20)

MD. Mamun Parvez (08 54 14)

Supervised by

Dr. MD. Rezaul Karim
Professor
Department of Civil and Environmental Engineering

Islamic University of Technology (IUT), Gazipur

ABSTRACT

Slum population has largely increased in Bangladesh over the last three decades along with growth and expansion of cities and towns. It creates additional pressure on the infrastructure and water resources. Rapid urbanization caused severe pressure on urban housing and public services. Access to safe water for drinking should be available to every human being, now and in the future. Water supply facilities in terms of quality and quantity are almost necessary for assessing the living environment of the slum. But slum facilities are very much unsatisfactory for them due to lack of proper water supply and sanitation system. As a result, majority of population in Bangladesh suffer from different kinds of water borne diseases that aggravate in their poverty situations. That's why, essential goal of the study is to investigate of water supply facility.

This report presents water uses pattern in an urban slum of Dhaka city. The investigation of respondents' characteristics, different available water sources, water quality and physical properties of water, health, hygiene and environmental condition are all included. During the study period, data and information were collected by questionnaire survey at Korail slum. During this study 170 participants were surveyed from the study area. The arranged and sorted out data has been correlation by Microsoft excel.

Water usage rates are different for various sources. In case of drinking purpose, 69% people use tap water, 3% people use bottle water and 28% people use well water. For cooking purpose, 69% people use tap water, 3% people use bottle water and 23%people use well water. 125 people said they drink 0-15 glasses of water daily and 45 people said they drink 15-30 glasses of water daily. For water treatment purposes, 15% people use boiling water, 3% people use water purification tablet, 9% people use filter and 77% people don't use any treatment. Showing any type of color in water is 45% and 55% water don't show any color. 45% people said that, Cost of water is 100-125 taka per month for a family, 51% people said that cost of water is 125-150 taka per month for a family. The amount of diarrhea affected people is 48% from the surveyed, cholera affected people is 21%, and 29% people said that water borne disease don't affect them. The study is aimed to motivate the slum living people to use safe treated water and grow awareness among them.

ACKONOWLEDGEMENT

The author humbly expresses the profound gratitude and deep sense of ineptness is also conveyed to Dr. Md. Rezaul Karim, Professor of Department of Civil and environmental Engineering, Islamic University of Technology, Board Bazar, Gazipur for his valuable and patient advice, sympathetic assistance, constant encouragement, guidance and detail comments at all stages. Without this, success of the research could not be achieved.

CONTENTS

1. Introduction

2. LITERATURE REVIEW

3. METHODOLOGIES

4. DATA SORTING AND ANALYSIS

31**5. DISCUSSIONS AND CONCLUSION**

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

1.1 General

Water is essential in every sphere of human life. Water contributes to the development of every parts of the world. It is found on earth in three states (liquid, solid, gaseous and various degree of motion). Water is in liquid state at standard temperature and pressure. The different aspects of life can be explained by water cycle.

Slum population on urban cities are increasing day by day in Bangladesh. Rapid urbanization in Dhaka city and migration of huge amount of people to the city causes scarcity of water, especially fresh drinking water. The millennium Development Goal's target of significantly improving the lives of at least 100 million slum dwellers by 2020 will depend in part on improved provision for water and sanitation, so having the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015 will depend in part on urban households that are able to move to new homes with better provision or able to invest in better provision within their existing home. However in Dhaka city of Bangladesh are far behind with respect to the Millennium development goals.

There are above 50 slums of various sizes in Dhaka city. Most of the slums are deprived of basic urban services. High population density combined with inadequate infrastructure and sanitation creates a deplorable environmental condition in these slums. Although located within city corporation limits, the slums and squatters facilities have limited access to the urban services. These problems are acute in Dhaka city.

Water supply facilities in terms of quality and quantity are absolutely necessary for assessing the living environment of the slum. In Bangladesh, over 97% of the population has access to tube-wells, tap or ring wells, and effectively lowered safe drinking water coverage to only 74% of the population. A large number of people use unsafe sources of water for personal

and domestic needs like cooking, bathing, and washing utensils, due to a lack of awareness about the safety of the water used for these purposes.

In this research work, we investigate on water consumption behaviour of urban slum in Dhaka City Corporation in relation with water sources and quality. We observe various sources and quality of the water for a particular slum. There are almost 80 thousand people in this area. This is one of the largest slums in Dhaka city. Supply water is their main source water. But in many families they don't even get that facility, and have to buy water or make well for themselves.

The water supply and its quality is the indicator of the living standard of urban life. Dhaka City Corporation had taken some measures in this regard. But those initiatives had not met the requisite demand and necessity of the growing people of slum due to a lot of limitations such as financial restraint, scarcity of the water resources inadequate planning and technical assistance etc. The study tries to find out the existing status of access of the slum dwellers to some selected urban services and explore the condition and problems of such services in slum. The main goal of our work is to identify the status of water use of Korail slum located in Mohakhali.

1.2 OBJECTIVE

So, the main objectives of this case study are-

1. To identify water consumption behavior of "Korail" slum peoples.

2. To estimate per capita daily water consumption.

3. To identify the factors affecting safe water consumption and household's preferences on water supply options.

1.3 IMPORTANCE

- Access to safe water for drinking should be available to every human being, now and in the future.

- Water supply facilities in terms of quality and quantity are almost necessary for assessing the living environment of the slum.

- In Bangladesh, over 97% of the population has access to tube-wells, tap-water, ring well etc, but effectively lowered safe drinking water coverage to only 74% of the population.

- A large number of people use unsafe water due to lack of awareness about the safety of the water used for Slum dwellers in urban slum in Bangladesh and are lagging behind from the millennium development goals.

- These problems are acute mainly in Dhaka city.

- The case study tries to find out the existing status of the slum dwellers to some selected water used and explore the problems of such uses in slums.

1.4 study area

- The research work is to be done in Korail slum, Mohakhali Dhaka including 19 wards.
- Table 1.1: Details of Korail slum area

•	Location	•	Korail slum, Mohakhali
•	Permanency	•	49 years
•	Area	•	85 Acres
•	Number of households	•	1100
•	Population	•	80000
•	Water facility	•	2 water points (1 DCC and 1 DWASA)
•	Sanitation facility	•	1120 water seal latrines
•	Drainage facility	•	Discontinuous semi-pucca drain
•	Solid waste facility	•	Open place
•	DCC	•	19 no. ward

1.5 Limitations of this study

We have done our analysis through questionnaire survey. We have filled up the survey sheets by the response of the people to the questions. Some people were not co operative with us. They show less interest with us. Some did not even give us any time, and some people didn't even understand the question. We had to be careful about asking the questions. Some people were biased with us. The answers were varied person to person, although their sources were same.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Slum population has been increasing in Bangladesh over the last three decades along with the growth and expansion of cities and towns. But slum facilities are very much unsatisfactory for them due to lack of proper water supply and sanitation system. That's why, essential goal of the study is to investigate of water supply facility.

2.2 Water Supply situation in Slum Areas

A study of slum populations estimated that almost half (47.5percent) of the total population of Dhaka lived in slums. Some of the criteria used by THE BANGLADESH BUREAU of statistics to identify slums include predominantly poor housing, poor quality or no sewerage and inadequate drinking water supplies. Many of the slums are located near polluted water bodies, swamps or putrid drainage canals. BANGLADESH BUREAU of statistics revealed that in Dhaka's slums, tube wells (39 per cent) and taps(31 per cent) were the most frequently used drinking water sources. Approximately 3 per cent of Dhaka slum households drank surface water from ponds, rivers or canals. Four per cent of Dhaka slum households drank non-tube well water.

2.3 Water supply situation in Korail Slum

The peoples of Korail slum area are not satisfied for the lack of proper water supply. Approximately, 79% respondents are not satisfied while 21% are satisfied for the availability of water source in Korail slum. There are the problems in fetching water from the source we get for DWASA water source which is far away and crowded 51%. The surrounding environment is unsuitable for fetching water for women 49% in the Korail slum area. We observed that collecting water from faraway is a major problem. In most cases water supply facility in the slums is provided by the NGOs through water point from DWASA. Water point is basically water storage facility where water is stored from WASA main lines. In the slums where the above facilities are absent or inadequate, the inhabitants use maximum water sources of DWASA and very few numbers depend on adjacent water bodies like ponds.

Location of Korail Slum
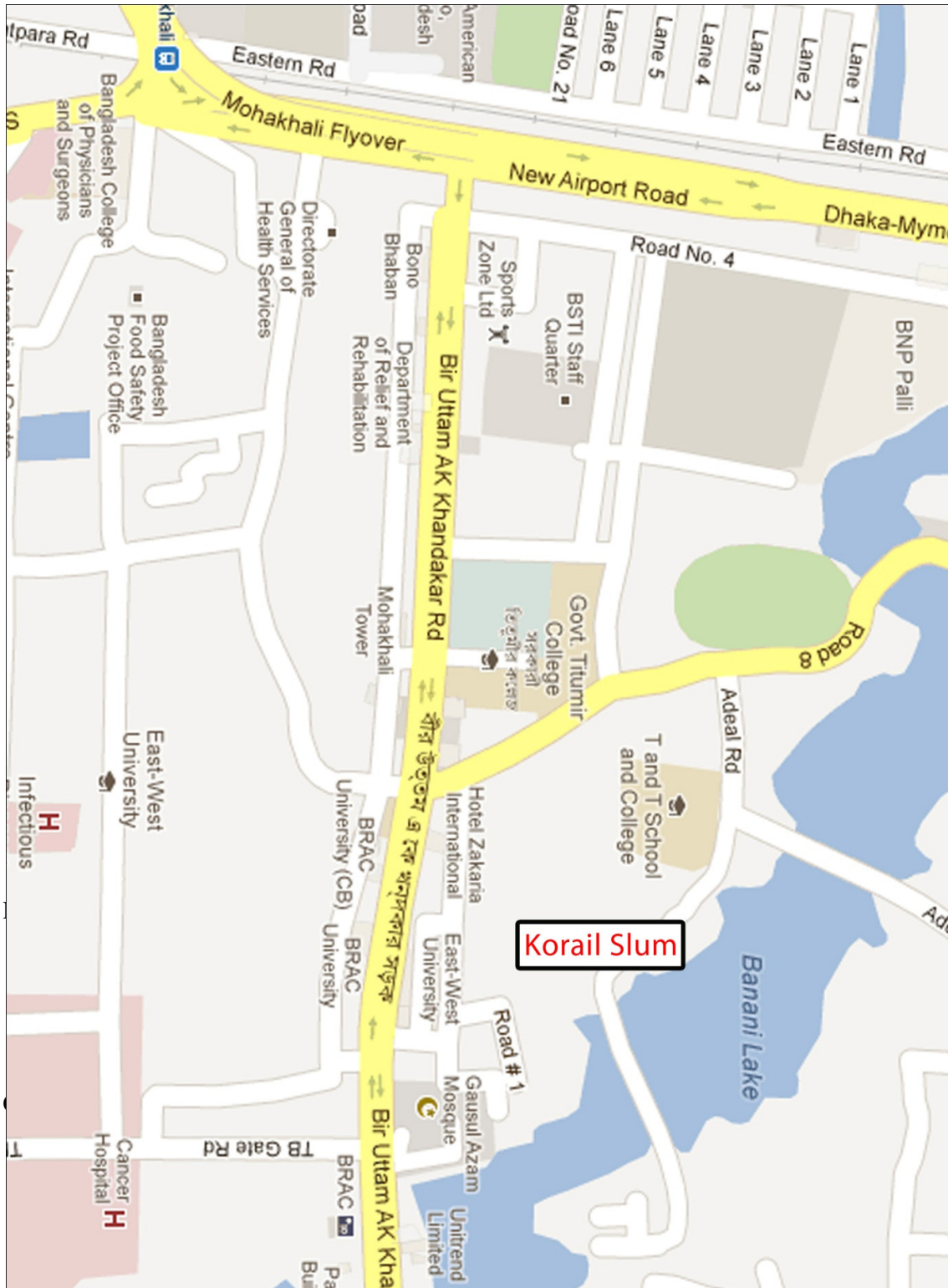
Figure 2.1: Location of Korail Slum

CHAPTER THREE

METHODOLOGY

3.1 Methodology

The methodology of this study includes

- **Concept generation:** Water is an indispensable natural resource for human survival. We have to know the information of the whole water consumption pattern about Korail slum for our thesis.
- **Literature review:** water supply condition, water sources, water consumption pattern are included in literature review.
- **Preparation of a questionnaire:** questionnaire has been prepared including all the enquiries required for the analysis of the study.
- **Questionnaire survey:** Surveys of local people have been performed to collect the required data. 170 participants were surveyed from the study areas.
- **Data sorting:** The collected data have been arranged and sorted out for the analysis.
- **Analysis:** The data have been analysed for correlation by Microsoft excel.

3.2 Questionnaire

The methodology of this survey consists of practical field observation and field based data collection of water supply condition through structured and non-structured questionnaire and formal and non-formal interviews. The question includes physical appearance of water such as color, odor and visible iron residue. The investigations are held regarding the inconveniences people face like hair fall, excessive uses of soaps, skin problem, sedimentation and many others while using the available water. The relevant secondary data for this study was collected from published and unpublished sources. The survey was, therefore, undertaken to explore the nature and many other habitation problem and different reason of environmental hazardous situation of water supply system includes in Korail slum.

3.3 Factors influencing People's Selection of Water Source

Although human mind and choice is unique, there must be some factors that have an influence on the selection of water sources for different uses. Availability adequate and safe water comes first in the list. The other factors are discussed below.

3.3.1 Occupation

Occupation represents the level of experience and awareness that has an influence on people's selection of water source. For example, a doctor or a teacher will not drink water from any regular source they get it from, but a driver or a mechanic may drink it.

3.3.2 Ward number

The Korail slum is under ward 19. Even City Corporation cannot serve the whole area. As a result most of the people collect their water from own management.

3.3.2 Age

Age represents the maturity level of a person that can influence the decision making about selection of water source.

3.3.4 Gender

Difference in gender defines the accessibility of a person beyond dwelling house. For example, a male person can take a bath in a pond anytime during a day, but in case of a female person it is difficult.

3.3.5 Authority

Authority in the family indicates to the priority of a person in a particular decision making for any occurring event. For example, the household head generally takes all the vital decisions while housewife and other members of family accept whatever decisions he makes.

3.3.6 Number of Family Members

The more family members in a family the more a decision will be influenced by them. So, number of family member has an influence.

3.3.7 Level of Education

It is a vital factor that has great influence in selecting what is beneficial and what is harmful. Educated people generally make valuable decisions.

3.3.8 Economic condition

Economic condition represents the status of a person in the society, economic condition also influence decision making. If a family is economically solvent it has more opportunity to get fresh water than an economically insolvent family.

3.4 Data Collection from Survey Areas

Primary information has been collected through questionnaire survey from Korail slum located in Mohakhali. This survey has been started from one side of the slum to other end.

Methodology is shown at a glance:

Concept Generation	→ Present water consumption pattern of Korail slum
↓	
Literature Review	→ Water supply condition, sources of water, consumption pattern
↓	
Collection of information	→ Present situation of sources of water in the areas of korail slum
↓	
Preparation of a questionnaire	→ Including all the inquiries required for the analysis
↓	
Questionnaire survey	→ 170 participants were surveyed
↓	
Data sorting	→ Arranged and sorted out
↓	
Analysis	→ Analysed for correlation by Microsoft excel

CHAPTER FOUR

DATA SORTING AND ANALYSIS

4.1 Sorting of collected Data

All the data have been categorized and sorted out by numerical values in the following manner before analyzing with Microsoft excel software.

4.1.1 Occupation

Based on occupation, the survey participants are represented by the following numeric values-

Student---------------------01

Businessman--------------02

Labor----------------------03

Housewife-----------------04

Rickshaw puller-----------05

4.1.2 Age

Based on age, the survey participants are categorized by the following numeric values-

Between (0-15) years-----------------01

Between (15-30) years---------------02

Between (30-45) years---------------03

Between (46-60) years---------------04

Above 60------------------------------05

4.1.3 Education

Based on level of education the respondents are represented by the following numeric values-

Illiterate-------------------------------01

Only signature------------------------02

Primary--------------------------------03

SSC------------------------------------04

HSC------------------------------------05

Graduate------------------------------06

4.1.4 Gender

Based on gender the survey participants are represented by the following numeric values-

     Male-----------------------------01

     Female-------------------------02

4.1.5 Household Expenditure

The economic condition of the survey participants were defined by the condition of their dwelling house. The economic condition of the respondents are represented by the following numeric values-

     Low (0-3500)------------------------01

     Good (3500-7000)-------------------02

     High (7000-10000)------------------03

4.1.6 Type of House

Based on the type of houses of the respondents are represented by the following numeric values-

     Hut----------------------01

     Tin shade---------------02

     Pucca--------------------03

4.1.7. Family members

Respondent's family members are represented by the following numeric values-

     Nuclear family (2-4 members)--------01

     Extended family (5-7 members)------02

     Large family (7 -10 members)---------03

     Joint family (above 10 members)-----04

4.1.8 Source of Drinking Water

Based on drinking, cooking, utensils washing, bathing, hand washing, washing clothes, raw vegetable washing and other necessities the respondents are represented by the following numeric values-

     Tap water----------------------------01

     Bottle water--------------------------02

     Well water----------------------------03

4.1.9 Source of other consuming water

Based on cooking, utensils washing, bathing, hand washing, washing clothes, raw vegetable washing and others source the respondents are represented by the following numeric values-

     Tap water----------------------------01

     Bottle water--------------------------02

     Well water----------------------------03

4.1.10 Household water treatment

Based on house hold water treatment the following numeric values-

     Boiling----------------------------01

     Water purification tablet-------02

     Filter-----------------------------03

     No treatment--------------------04

4.1.11 Color Change

Based on showing color of the respondents are represented by the following numeric values-

     Yes-------------------------------01

     No--------------------------------02

4.1.12 Red color

Based on showing red color of consuming water after 30 minutes the respondents are represented by the following numeric values-

Yes------------------------------01

No------------------------------02

4.1.13 Sediment Content

Based on containing sediment of consuming water the respondents are represented by the following numeric values-

Yes------------------------------01

No------------------------------02

4.1.14 Need of huge Detergent

Based on needed huge detergent of consuming water the respondents are represented by the following numeric values-

Yes------------------------------01

No------------------------------02

4.1.15 Taste of Water (Sweet, saline)

Based on taste of drinking water after 30 minutes the respondents are represented by the following numeric values-

Yes------------------------------01

No------------------------------02

4.1.16 Negative Impact of water on Hair

Based on impact of bath on hair the respondents are represented by the following numeric values-

Yes------------------------------01

No------------------------------02

4.1.17 Huge soap consumption

Based on huge soap consumption is needed   the respondents are represented by the following numeric values-

       Yes-------------------------------01
       No--------------------------------02

4.1.18 water supply available

Based on water supply availability the respondents are represented by the following numeric values-

       Morning-------------------------01
       Afternoon-----------------------02
       Night-----------------------------03

4.1.19 cost of water per month

Based on cost of water per month availability the respondents are represented by the following numeric values-

       100-125(taka)--------------01
       126-150---------------------02
       Above 150------------------03

4.1.20 water borne diseases

Based on diseases suffered by the respondents are represented by the following numeric values-

       Cholera-------------------01
       Diarrhea-----------------02
       Others---------------------03
       None---------------------04

4.2 Survey Participants Characteristics

The area Korail slum the research was done is a blend of various kinds of people. Their economic condition and level of education is poor so good. Here, the amount of male people is 61%, while the amount of female is 39%. In the area , about 170 households were surveyed. The characteristics of the people under the survey is described below in a tabular form-

Table-4.1: survey participant's characteristics

Respondent's characteristics	Frequency (f)	Percentage(%)
Age		
1.Between 0 - 15 years	12	7
2.Between 15- 30 years	37	22
3. Between 30 - 45 years	90	53
4. Between 46 - 60 years	23	13
5. above 60 years	8	5
occupation		
1.Student	12	7
2.Businessman	38	22
3.Labor	45	27
4.Housewife	25	15
5.Rickshaw puller	50	29

Respondent's Characteristics	Frequency (f)	Percentage (%)
Gender		
1.Male	104	61
2.Female	66	39
Monthly Income(Taka)		
1.Low(0-3500)	71	42%
2.Moderate(3500-7000)	90	53%
3.Good(7000-10000)	9	5%

Level Of Education		
1.Illiterate	30	18
2.Only signature	81	48
3.Primary	58	34
4.Ssc	0	00
5.Hsc	0	00
6.Graguate	0	00
TYPE of House		
1.Hut	0	0
2.Tin shade	170	100
3.Pucca	0	0
Disease		
1.Cholera	36	48
2.Diarrhoea	81	21
3.others	6	2
4.None	49	29

4.3 Analysis and Results

For analysis the categorized data have been put into the Microsoft Excel software the factors affecting the selection of water sources as the independent variables and the number of selected sources of water in choosing them as the dependent variables after sorting out. The obtained analysis is presented below.

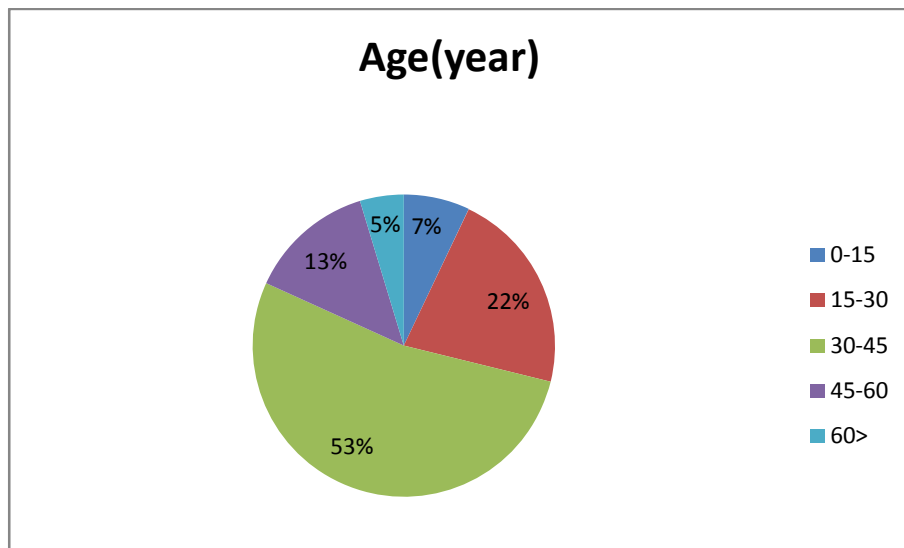## 4.3.1 Percentile distribution of Age of inhabitants:

Figure 4.1: Age (year) level of slim dwellers

Here, we see that 7% of total no. of participant is within 15 years, 22% are below 30 years. Above 50% People are in age limit 30- 45.5% people are above 60 years.

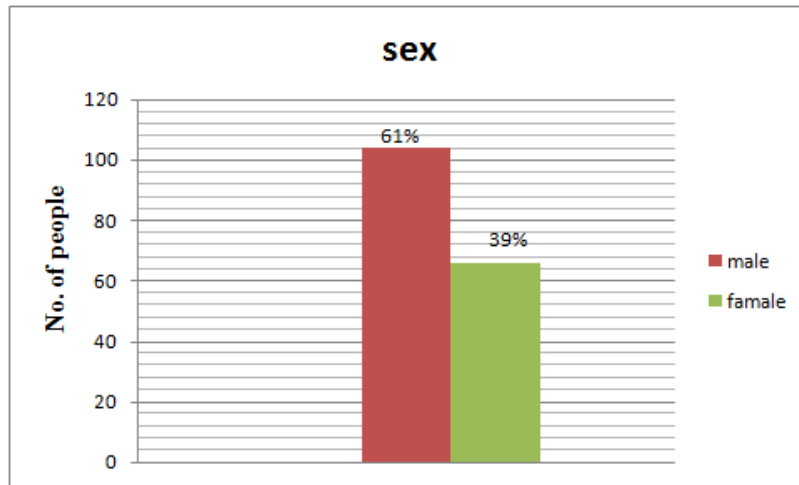## 4.3.2 Gender variation of slum dwellers

Figure 4.2: Gender variation of slum dwellers

We surveyed on 170 people.104 are male and 66 are female .All are represents a individual family

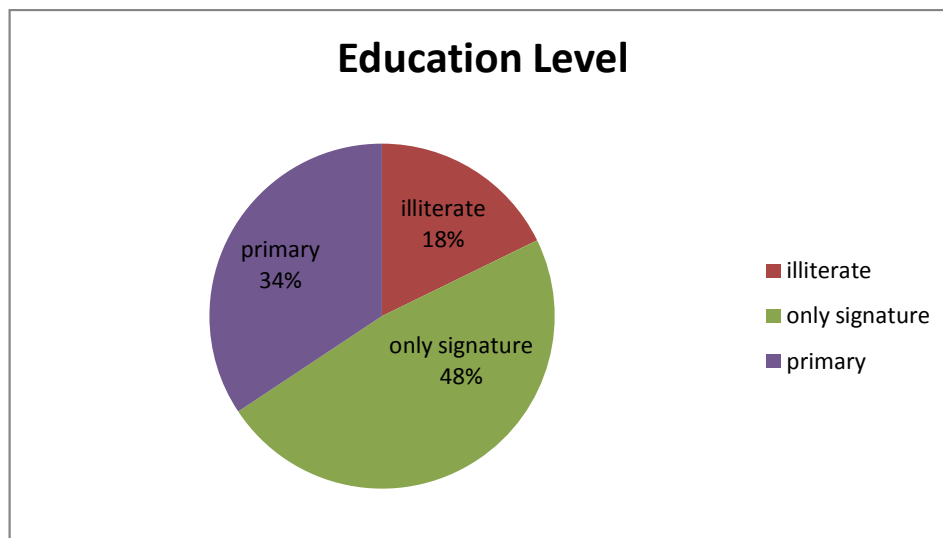## 4.3.3 Percentile distribution of Education Level of inhabitants

Figure 4.3: Education level of slum dwellers

We observed that among 170 people, 18% people are illiterate, 48 % people can only signature their name, and 34% people only completed their primary education.

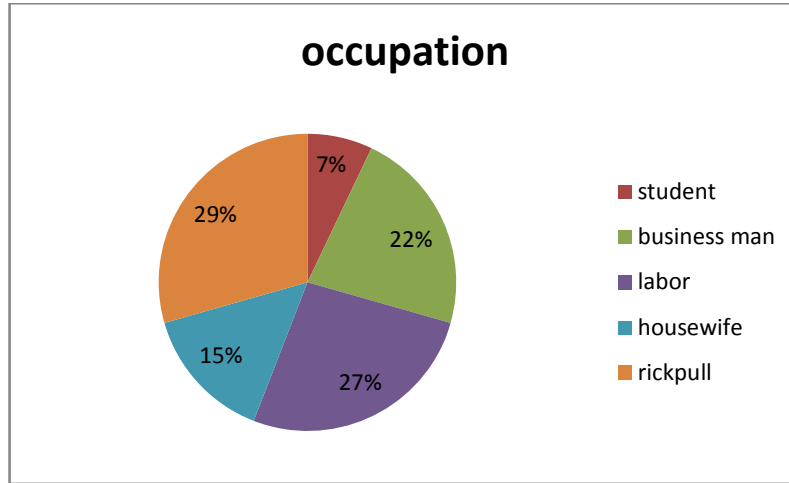## 4.3.4 Percentile distribution of occupation of slum inhabitants

Figure 4.4: Occupation level of slum dwellers

They are normally labour or rickshaw puller and women are normally housewife. Among 170 people 22% people are business man, 26% people are labour, a large amount of people 29% people are rickshaw puller,15 % people are housewife.

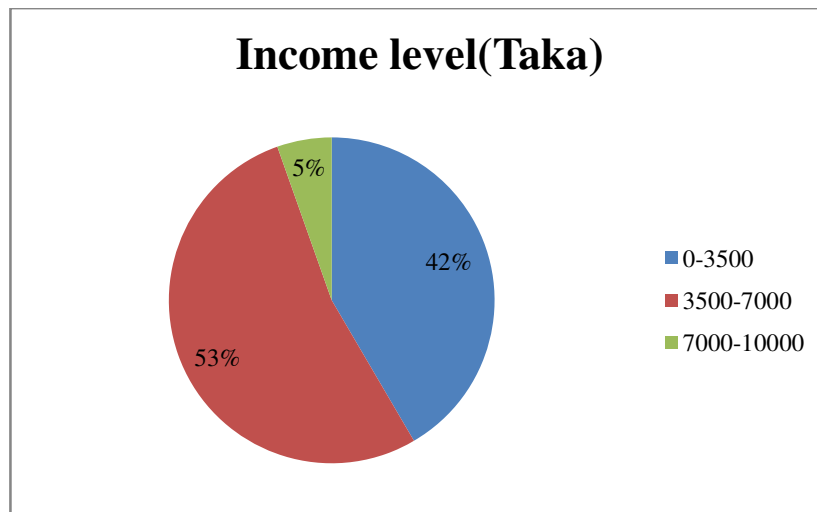## 4.3.5 Percentile distribution of income level of inhabitants

Figure 4.5: Income Level of slum dwellers

From survey of 170 people we found that, the income, ranging from 0-3500 taka is 43%, 3500-7000 taka is 51% and above 7000 taka is 5%.
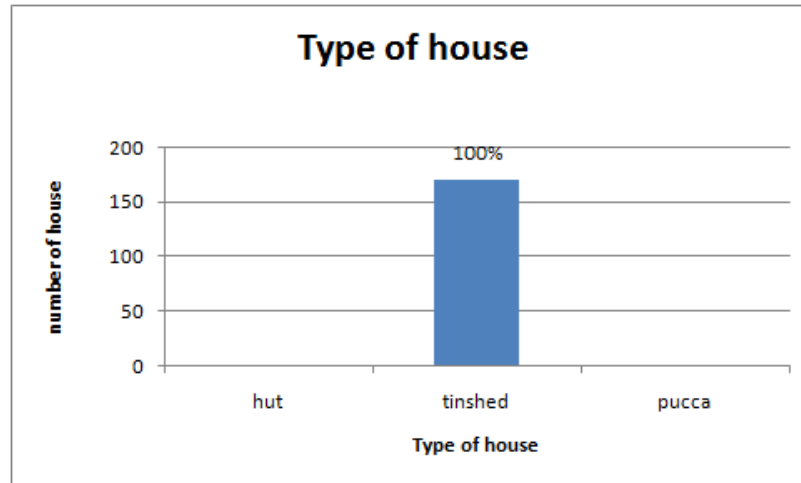
4.3.6 Number of type of houses of inhabitants

Figure 4.6: Type of house

All houses are tin shed there.

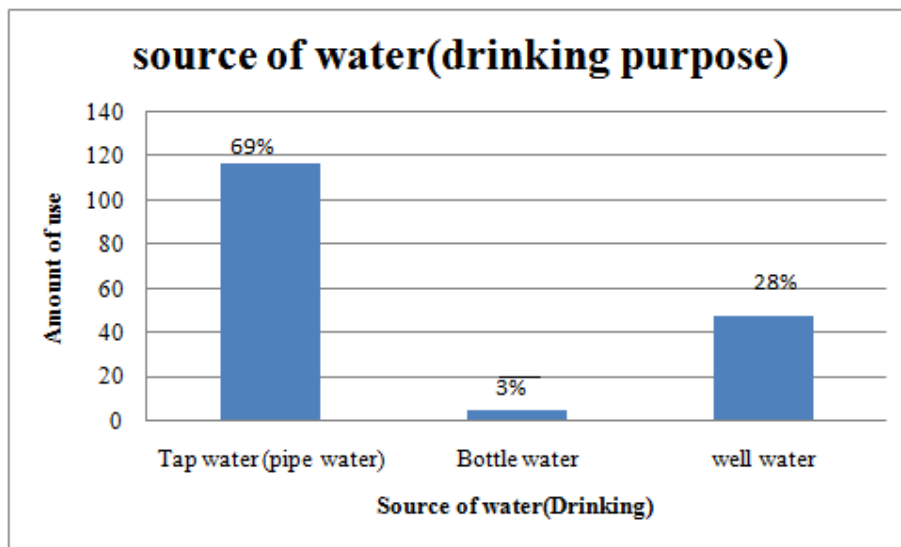## 4.3.7. Distribution of water outlets (drinking purpose)

Figure 4.7: Source of water outlet (Drinking purpose)

117 people said that they use tap water for drinking. 5 people drink bottle water and 48 people drink well water.

4.3.8 Distribution for sources of water (cooking purpose)
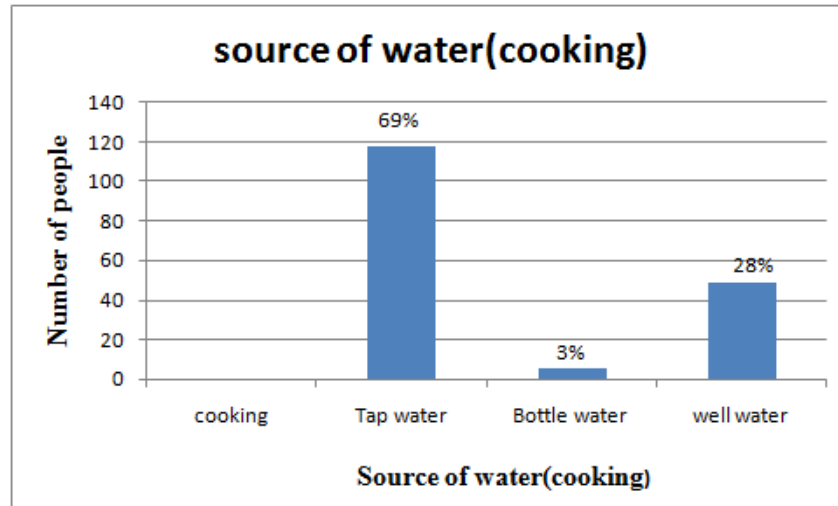

Figure 4.8: Source of water outlet (cooking purpose)

Normally people use tap water for their cooking purpose. Some people use well water.

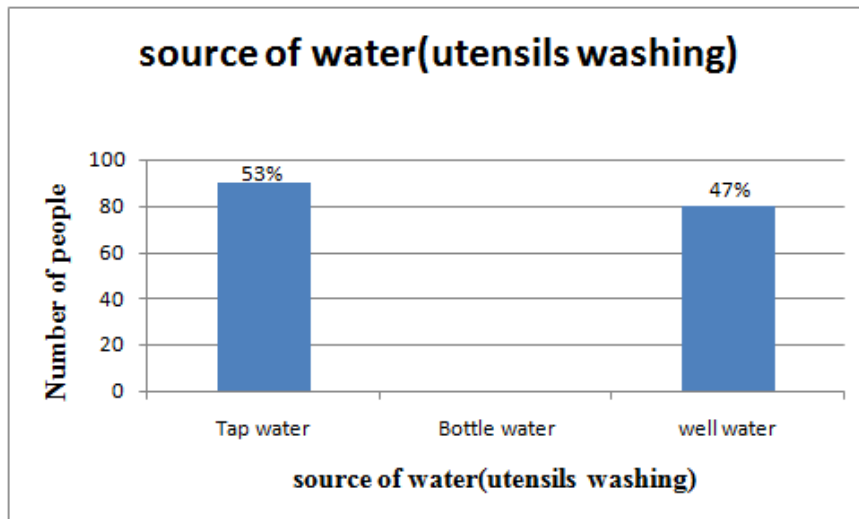## 4.3.9 Distribution for Sources of water (utensils washing)

Figure 4.9: Source of water outlet (utensils washing)

People use tap water or well water as usual for their utensils washing

4.3.10 Distribution for sources of water (Bathing purpose)

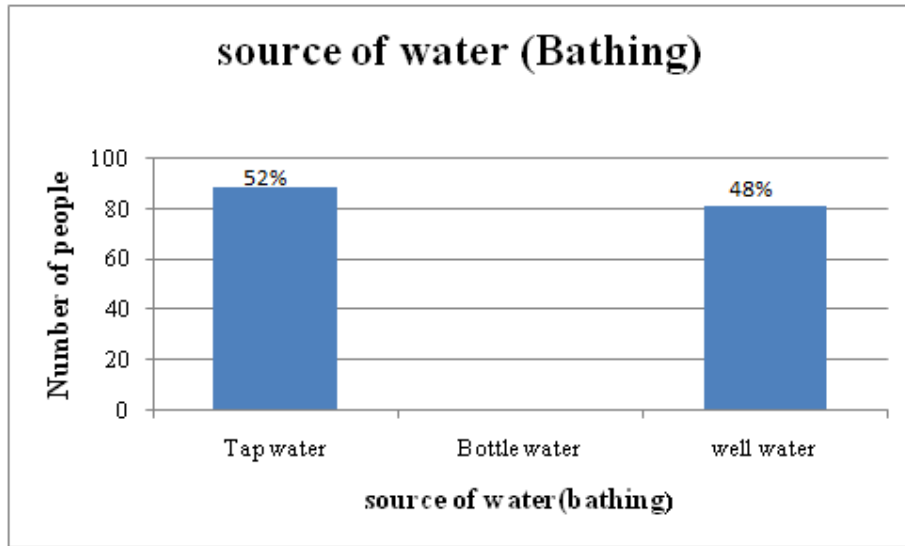**Figure 4.10: Source of water outlet (Bating purpose)**

89 people said that they use tap water for bathing and 81 people use well water for bathing.

4.3.11 Distribution for sources of water (Hand Washing)
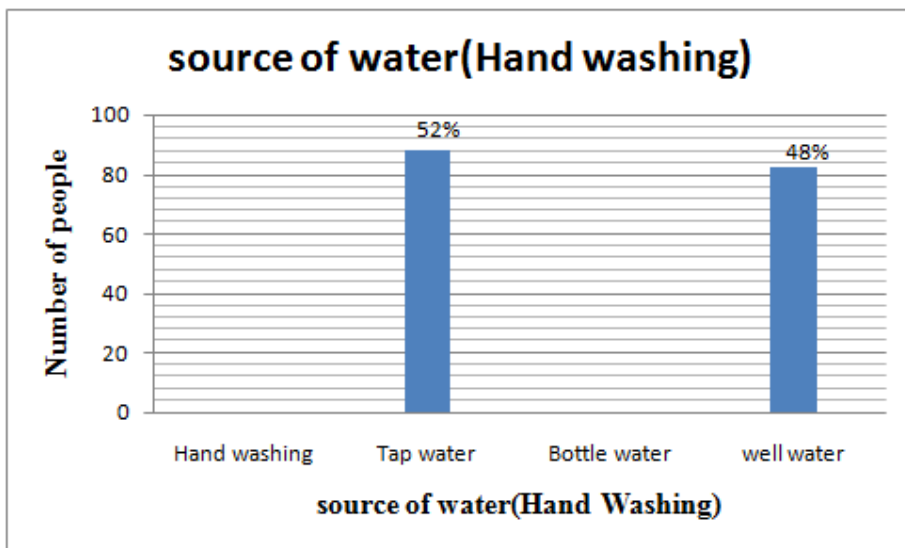
Figure 4.11: Source of water outlet (Hand washing purpose)

88 people said that they use tap water for hand washing and 82 people said that they use well water.

4.3.12 Distribution for sources of water (Washing clothes)

Figure 4.12: Source of water outlet (Washing outlet)

88 people used tap water for washing cloth and 82 people use well water.

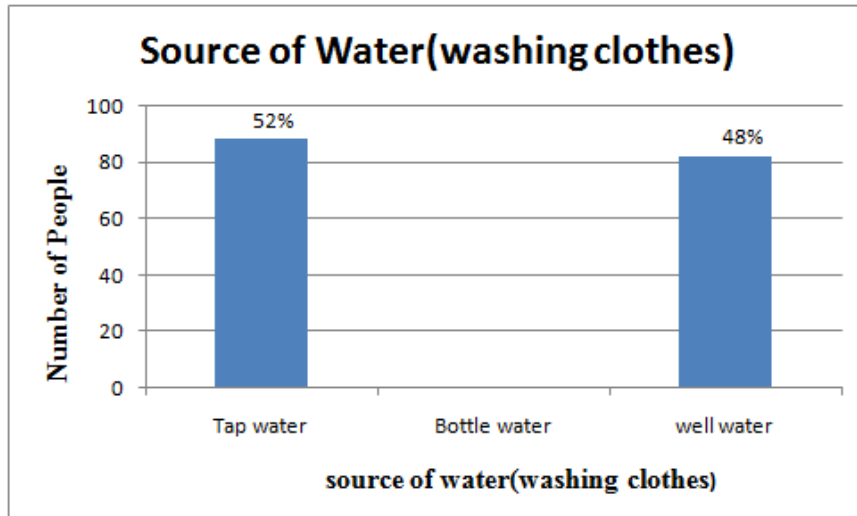## 4.3.13 Distribution for sources of water (Raw vegetable washing)
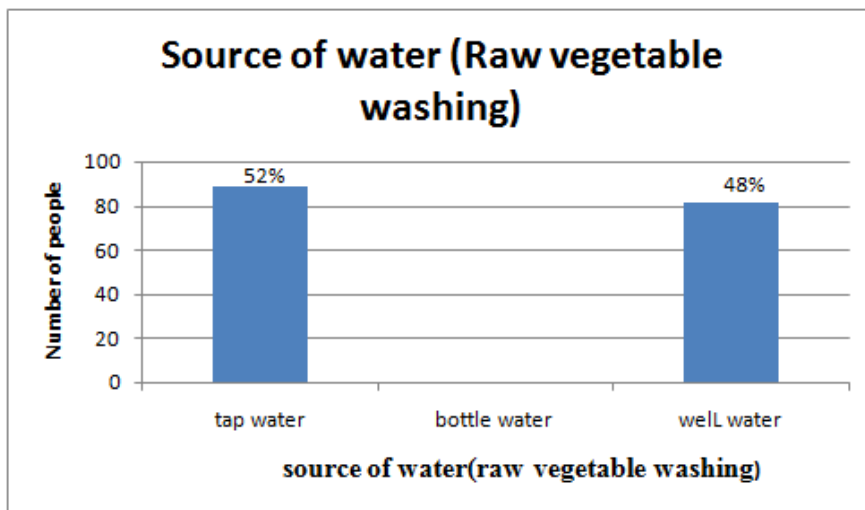
Figure 4.13: Source of water outlet (Raw vegetable washing)

Here 89 people said that they use tap water for raw vegetation washing and 81 people use well water.

4.3.14 Amount of water consumed for drinking purpose
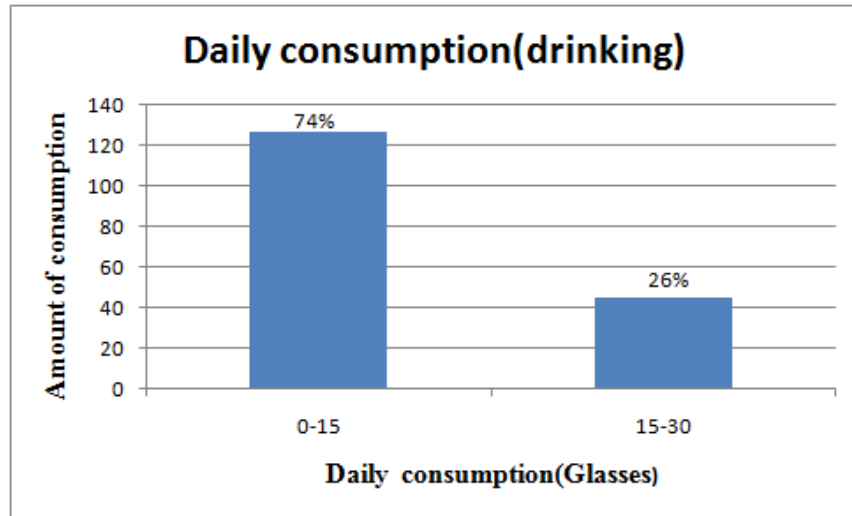
Figure 4.14: Daily consumption (Drinking purpose)

125 people said they drink 0-15 glasses of water daily and 45 people said they drink 15-30 glasses of water daily . It was assumed that , 4 glass=1 litre.

4.3.15 Amount of water consumed for House hold purposes
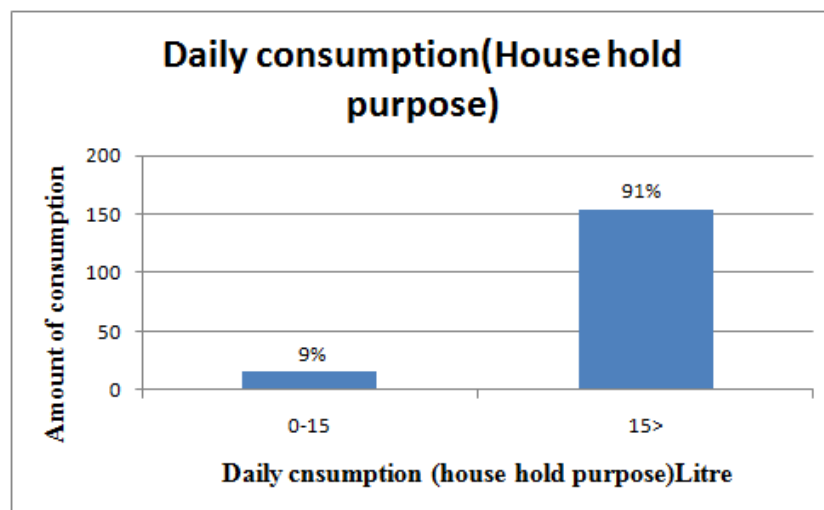
Figure 4.15: Daily consumption (House hold purpose)

Normally they use above 15 litres of water for household purposes. About 154 peoples said that , they use above 15 litres water for their house hold purposes.

4.3.16 Percentile distribution methodology of Water treatment
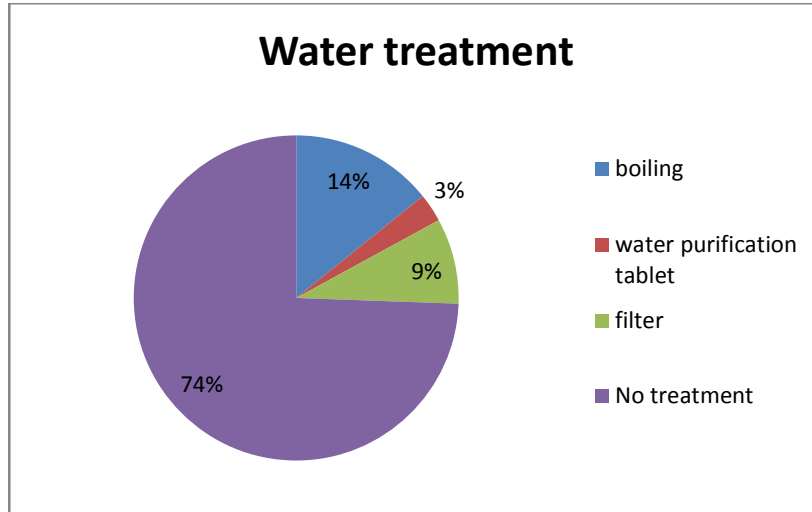
Figure 4.16: Water treatment of slum dwellers

We observed that among 170 people, 25 people use boiling water and 15 people use filter and rest of them don't even treat the water. And the amount of rest of the people is 131 people.

4.3.17   People reporting discolor of Water
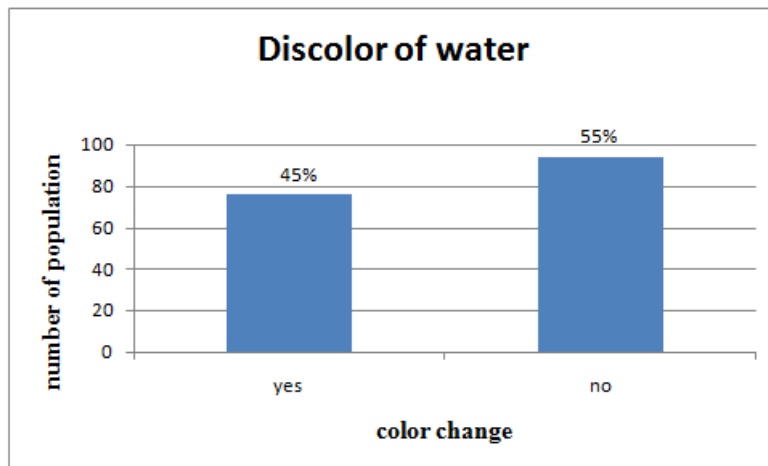
Figure 4.17: Color change

We observed that among 170 people, 76 people said that, the color of the water has changed from the normal one and the remaining one said that the color of the water doesn't change.

4.3.18 People reporting periodical color change of water

periodical color change of water

Number of people

- 45% — yes
- 55% — no

Become red in 30 mintues
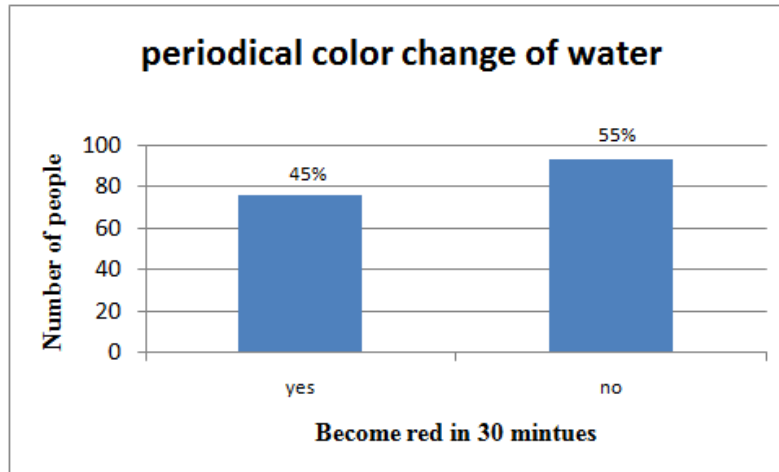
Figure 4.18: Periodical color change of water of slum dwellers

The colour of water is normally unchanged in most of the cases. From the surveyed, 94 people said that, colour don't change after 3o minutes.

4.3.19 People reporting of sediment content

sediment content

Amount of people

- 71% — yes
- 29% — no
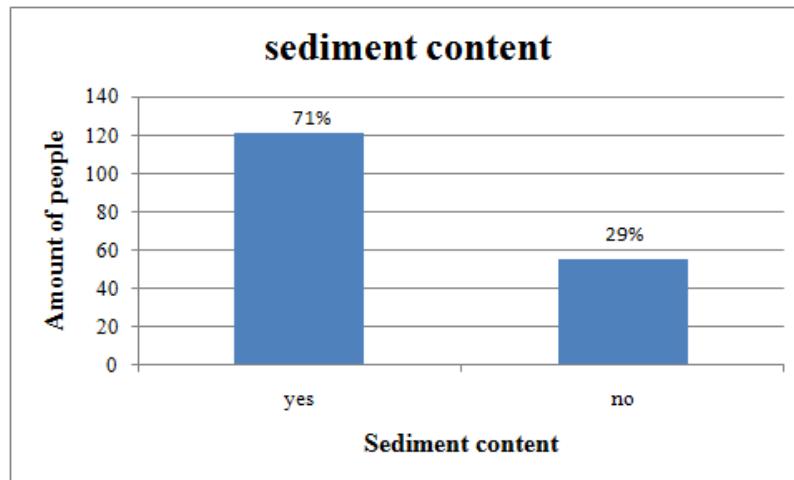
Sediment content

Figure 4.19: Sediment content

We observed that among 170 people, normally 121 people said that, water content sediment, and rest of the 49 people said that, water do not have sediment content while the use the water.

4.3.20 People reporting of high amount soap required

Figure 4.20: Amount of soap required

We observed that among 170 people. From them 68% people said that, while using the water the more amount of soap is needed and 32% people said that not much amount of soap is needed while using that water.

4.3.21 People reporting regarding Taste of water
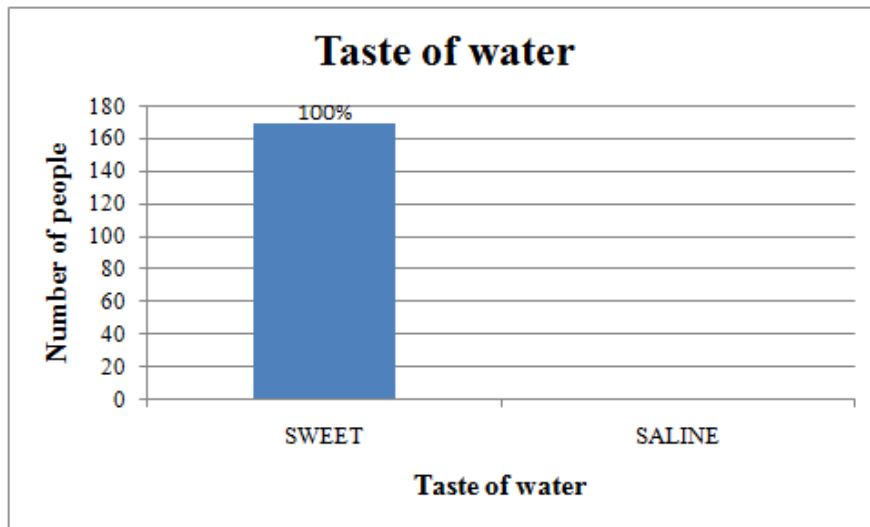
Figure 4.21: Taste of water

Almost all people said that the taste of water is not saline.

4.3.22 People reporting using various type of toilet
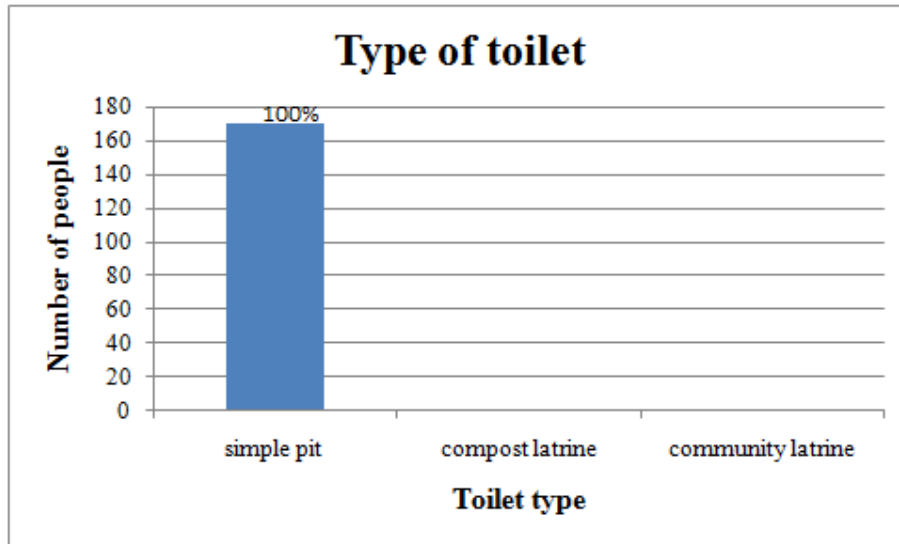
Figure 4.22: Type of toilet

They normally use simple pit toilet.

4.3.23 People reporting of supply condition
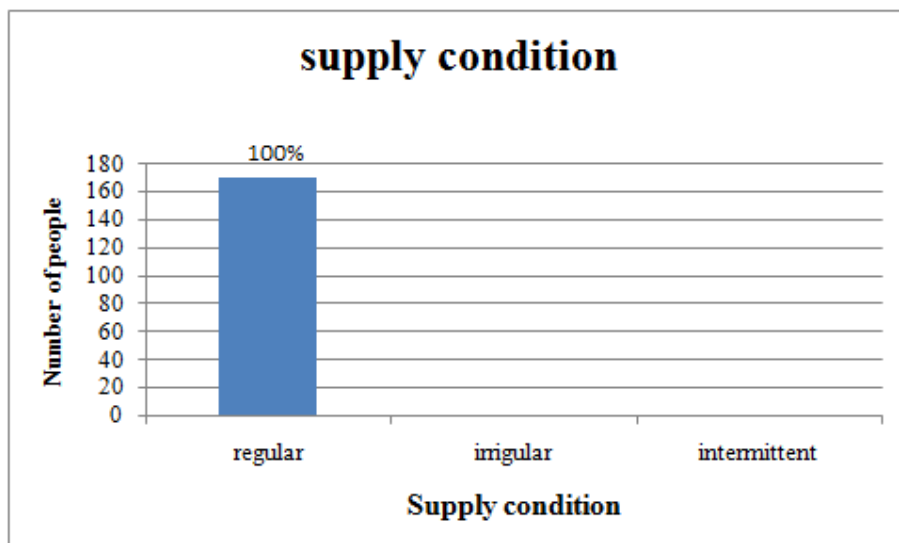
Figure 4.23: Supply condition of slum dwellers

All most all people said that, supply condition of water is regular.

4.3.24 Percentile distribution of supply availability (Time)
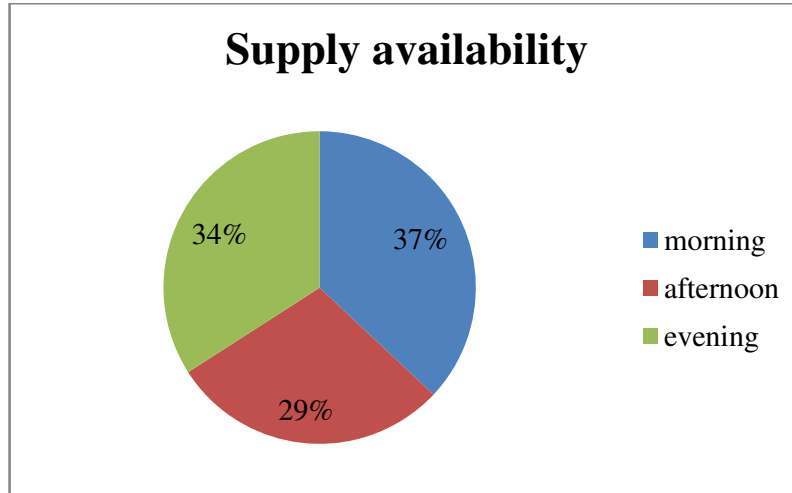
Figure 4.24: Supply availability of slum dwellers

Supply of water is regular. But it is normally once in a day.62 people said they they get water in morning. 50 people said they get water in afternoon and 58 are in evening.

4.3.25 Percentile distribution of cost of water

Figure 4.25: Cost of water (Taka)

Among observation of 170 people, 45% people said that, Cost of water is 100-125 taka per month for a family, 51% people said that, cost of water is 125-150 taka per month for a family and 4% people said that, cost of water is among 170 taka per month .

4.3.26 Percentile distribution of water borne disease among inhabitants
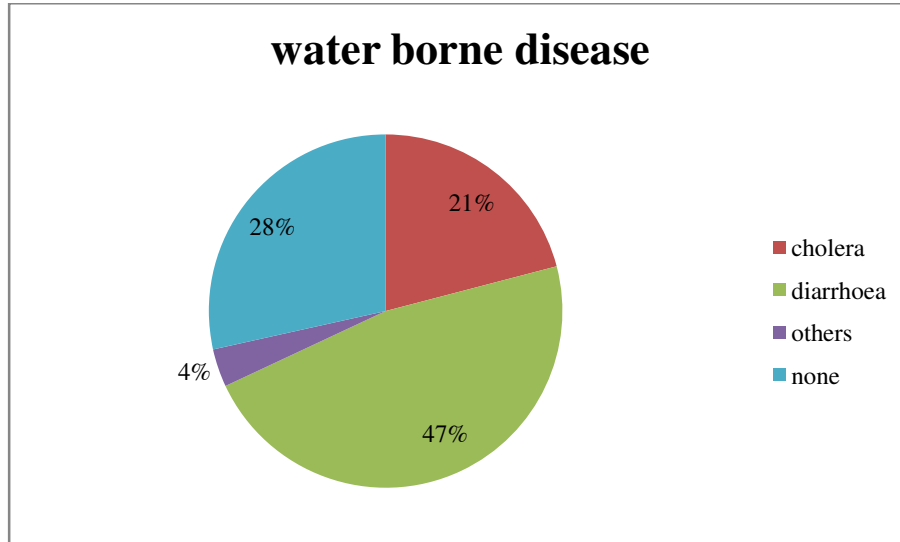
Figure 4.26: Water borne disease of slum dwellers

Most of the people effect on cholera and diarrhoea by using the water. And the amount of diarrhoea affected people is 48% from the surveyed, cholera affected people is 21%, and 29% people said that water borne disease don't affect them.

CHAPTER FIVE

DISCUSSIONS AND CONCLUSION

5.1 Major findings of the study

- For drinking purpose, 69% people use tap water, 3% people use bottle water and 28% people use well water.(fig. 4.2.5)
- For cooking purpose, 69% people use tap water , 3% people use bottle water and 23%people use well water.(fig. 4.2.6)
- For bating purpose, 52% people use tap water, 48% people use well water .(fig. 4.2.8)
- For washing purposes, 52% people use tap water, 48% people use well water.(fig.4.2.10).
- For water treatment purposes, 15% people use boiling water, 3% people use water purification tablet, 9% people use filter and 77% people don't use any treatment.(fig. 4.2.16)
- Showing any type of color in water is 45% and 55% water don't show any color.(fig.4.2.17)
- About 45% respondents face their water become red after 30 min. of supply and 55% respondents don't face their water becoming red.(fig. 4.2.18)
- About 71% of respondent's water needs a huge amount of detergent for washing when 29% does not need so much.(4.2.19)
- About 68% people said that, while using the water the amount of soap is more needed and 32% people said that not much amount of soap is needed while using that water.(4.2.20)
- In this study 100% water is sweet.(fig 4.2.21)
- In this study 100% people use simple pit latrine(fig 4.2.22)
- In this study the supply condition of water is regular(fig 4.2.23)
- In this study, 36% people said they get water in morning. 29% people said they get water in afternoon and 34% people said that they get water in evening .(fig. 4.2.24)
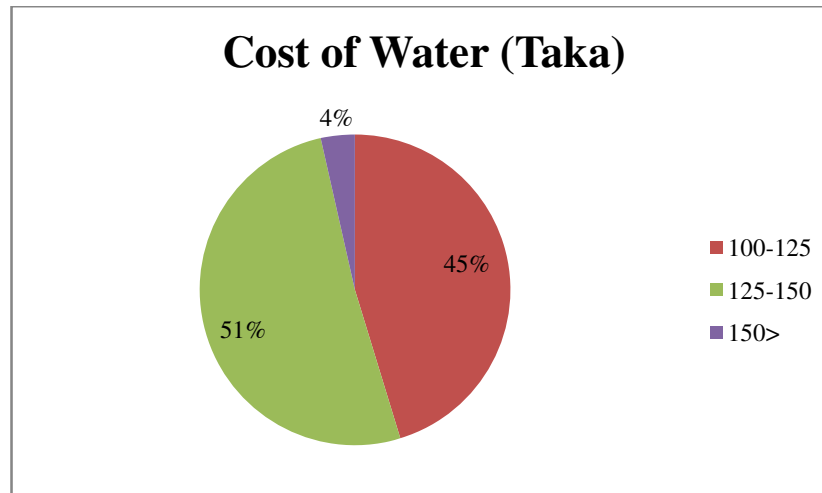- Among observation of 170 people, 45% people said that, Cost of water is 100-125 taka per month for a family, 51% people said that, cost of water is 125-

150 taka per month for a family and 4% people said that, cost of water is among 170 taka per month. (fig. 4.2.25)

- The amount of diarrhoea affected people is 48% from the surveyed, cholera affected people is 21%, and 29% people said that water borne disease don't affect them. (fig. 4.2.26)

5.2 Comparisons with similar studies

The studies show some similarities in its findings as well as some differences with similar studies undertaken previously in slum or city areas. Some of the comparable findings as such:

- In the study undertaken, thought out the survey 42% of people say's around TK.0-3500, and 51% of people are getting approximately TK.3500-7000 taka per month. This finding is in similar trend with findings in Korail slum, (Pramanik Biplob et. al. 2011) where Thought out the survey 49% of people say's around TK. 3000-5000, and 51% of people are getting approximately TK.5000-8000 per month.

- It was observed that for drinking purpose 69% people use tap water, 3% people use bottle water and 28% people use well water. This finding is in sharp contrast with the findings in Rupsha Ferighat slum, (Rana 2008) where around 80% respondents use deep tube-well water for their drinking water.

- For washing clothes purposes 52%people use tap water, 48% people use well water in Kurail slum. This finding is in sharp contrast with the findings in Rupsha Ferighat slum, (Rana 2008) where above 75% respondents use river water.

- In this study, it was observed that for bating purposes 52% people use tap water, 48% people use well water. This finding shows variance with the findings in Rupsha Ferighat slum, (Rana 2008) where above 45% respondents use shallow tube-well water.

- In the length of this study, we found that most of the slum dwellers are dependent on tap-water or well water, and majority of them have their source of drinking water available within 66 ft, but this finding is different from the findings in Rupsha Ferighat slum, (Rana 2008) where most people (44.44%) have to cross above 300 ft to get water.

- In this study, we found that 100% people use simple pit latrine but this finding is in sharp contrast with the findings in Rupsha Ferighat slum,(Rana 2008) where 27% respondents use water sealed latrine, 23% respondents use metallic latrine and water hanging latrine of 50% in the slum areas.

- In this study, we found that most of the slum dwellers washing hands after defecation but this findings is in sharp contrast with the findings in Bangladeshi slums, (Suzanne Hancheet et. al 2003) where 56% people washing their hands after defecation and using sandals (30 per cent).

- In this study, we found that 45% people said that, Cost of water is 100-125 taka per month for a family, 51% people said that, cost of water is 125-150 taka per month for a family and 4% people said that, cost of water is among 170 taka per month. But this finding is in sharp contrast with the findings in Bangladeshi slums, (Suzanne Hancheet et. al 2003) where most of the people said that, cost of water is around 60-80 taka per month and they pay daily 2 taka for their water.

- In this study, we found that The amount of diarrhoea affected people is 48% from the surveyed, cholera affected people is 21%, and 29% people said that water borne disease don't affect them. This finding is in similar trend with findings in Korail slum, (Pramanik Biplob ct. al. 2011) where The diseases of Diarrhoea, Dysentery and cholera affected people were 50%, 24% and 26% respectively

5.3 Recommendation

- In the rainy season some family don't get fresh water. In that case they have to buy jar or drum. But it can be solved by developing a system by which those families can get fresh water easily without buying jar or drum.

- In some journals the survey procedure was done on 250 people or 300 people. But due to lack of time we can survey only on 170 people. For more optimistic analysis, more number of households needed to be surveyed.

- From analysis it is found that 50% people are not doing any treatment of water. As a result 21% people are getting affected by Cholera and 48% people are by

  Diarrhoea. We tried to convince them so that they use water treatment procedures like boiling, filtering etc to get rid from these diseases.

- People of the survey spot (Korail Slum) have to pay 120-150 taka to their house owners for the supply of water. We want that the amount should be reduced to a tolerable limit for those poor people.

5.4 Conclusion

The level of hygiene knowledge and practice has been found to be significantly low among the Korail slum dwellers. More than 80000 people live in the Korail Slum and all of them are deprived of water supply facility. Pure water supply is very essential because most people are using the bad quality of water for different household purposes. Though people makeup their demand by facilities like tap water, bottle water and well water. Slum people are fighting against poverty and trying to improve their economic condition and standard of living. However, Government and in some cases, NGOs should be encouraged and offered the best facilities for taking more programs in slum areas on water supply.

REFERANCES

1.United States Agency for International Development (USAID) (1999). Environmental Mapping and Workbook for Khulna City, USAID, Dhaka, Bangladesh.

2. Pramanik Biplob, Dipok Chandra Sarker, Ram Chandra Sarker, 2011; Assessment of water supply and sanitation facilities for korail slum in Dhaka city, October 2011.

3.Rural water consumption behavior: A case study in southwest coastal area, Bangladesh. M A islam, H. Sakakibria, M R karim, and M. Sekine.

4.M.D. sohel Rana; 2008; status of water use sanitation and hygienic condition of urban slums: A study on Rupsha Ferighat slum, Khulna, April 2008.

5.Suzanne Hanchett, Shireen Akhter and Mohidul Hoque Khan-summarized by Stephen Mezulianik and Vicky Blagbrough,2003; Water, sanitation and hygiene in Bangladeshi slums: an evaluation of the Water Aid-Bangladesh urban programme, October 2003.

APPENDIX

Questionnaire Survey on water use pattern of urban slum-a case study of Dhaka city

Area-> Dhaka city area

A. Demographic Questions

1. Personal Questions:

a. Name:

b. Ward No:

c. Age Group: ☐ 0-15 ☐ 15-30 ☐ 30-45

☐ 46-60 ☐ above 60

d. Sex: ☐ male ☐ female

e. Education: ☐ illiterate ☐ Only signature ☐ primary

☐ SSC ☐ HSC ☐ graduate

f. Occupation : ☐ student ☐ businessman ☐ labor

☐ Housewife ☐ rickshaw puller

g. Income : ☐

h. Type of House : ☐ Hut ☐ Tin shed ☐ Pucca

i. No. of family members : ☐

B. Water Consumption Related Questions:

Which sources of water do your household members generally use for the following purpose (please write the amount (litre) in the appropriate column)

Use of water	Sources of water				
	Tap water	Tube-well water	Bottle water/jar water	Harvested rain water	Other sources
Drinking					
Cooking					
Utensils washing					
Bathing					
Hand washing					
Washing clothes					
Raw vegetable washing					
Others					
Total					

How many glasses of water your family consume everyday (drinking purposes)? (4 glasses = 1 litre)

Respondent: …………../glasses

How many litres (No. of pitchers) do you fetch everyday for household purposes?

☐ 0-5 ☐   6-10 ☐ 11-15 ☐   above 15

Distance of water source from house?

Source:

Distance:

Time required for water collection (for fill up kolshi/ per collection)?

☐ 5 minutes ☐ 10 minutes ☐ 20 minutes ☐ 30 minutes ☐ 1 hour

☐ 2 hours ☐ 1.5 hours ☐ >2 hours

Time required for transportation?

☐ 5 minutes ☐ 10 minutes ☐ 20 minutes ☐ 30 minutes ☐ 1 hour

☐ 2 hours ☐ 1.5 hours ☐ >2 hours

Household water treatment

Boiling	Carbon filter	Chlorination	Water purification tablet	Filter	Others	Don't know

C. Influencing factors:

1. Problems with water supply
   a. Does the water become any color?   Yes ☐   No ☐
   b. Does the water become red in 30 min. of supply?   Yes ☐ No ☐
   c. Does the water contain any sediment?   Yes ☐   No ☐
   d. Does the washing need huge detergent/soap?   Yes ☐ No ☐
   e. Taste of water: ☐ Sweet ☐ Saline

2. Quality of water:

47

a. Bathing :--Good for hair: ☐ Yes ☐ No

b. Huge soap consumption: ☐ Yes ☐ No

c. Drinking : taste is good: ☐ Yes ☐ No

D. Sanitation patterns

Type of toilet:

Simple pit latrines	Ventilated improved pit latrine	Compost latrine	Community latrine

Hygienic pattern:

Use sandal	Children	Male	Female

Use sandal	Children	Male	Female

E. Common questions:

a. Water collection behaviours

Who is responsible for water collection?

Purposes	Responsible person for water collection				
	Women	Men	Children	Caretaker	Others
Drinking					

Cooking / Washing dishes					
Bathing / Washing clothes					
Toilets					

b. Existing condition in context of supply:

☐ Regular ☐ Irregular ☐ Intermittent

c. Frequency or duration of supply:

a. Whole day : ☐ Yes ☐ No

b. Supply per day : ☐ Once ☐ Twice ☐ Thrice ☐ More

c. When supply available? ☐ Morning ☐ Noon
☐ Afternoon ☐ Evening

d. Do you get sufficient water supply both at dry season and wet season?

☐ Get sufficient supply in all season

☐ Only in wet season

e. Duration of water use

Principle water sources	Most frequent response in months
Rainwater harvesting system	
Tube-well water	
Tape water	
Pond water	

f. If do not get sufficient water in dry season, then what are the alternative sources of water supply in those periods?

☐ Tap water ☐ Rain water

☐ Tube-well water   ☐ Bottle water

g. If any fees is paid for supply water? ☐ Yes ☐ No

   If yes then how much/month? [_____]

h. Water borne diseases : ☐ dysentery ☐ typhoid ☐ cholera

   ☐ Diarrhoea ☐   others ☐   none

i. Who provides the tube-well/deep tube-well?

   Contribution:

   Maintenance:

j. Overall comment on water supply management:

………………………………………………………………………………
………………………………………………………………………………
………………………………………………………………………………
………………………………………………………………………………
………………………………………………………………………………
……………

Name   of   Interviewer…………………………….

Date……….………………..