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**WATER SUPPLY, SANITATION AND HYGIENE EDUCATION  
IN RURAL BANGLADESH: THE CASE OF THE BARISAL  
(SOUTHERN DIVISION) REGION.**

Dewan Manirul Hoque



Stockholm 1998

Master of Science Thesis Report  
Division of Land and Water Resources  
Department of Civil and Environmental Engineering  
Royal Institute of Technology

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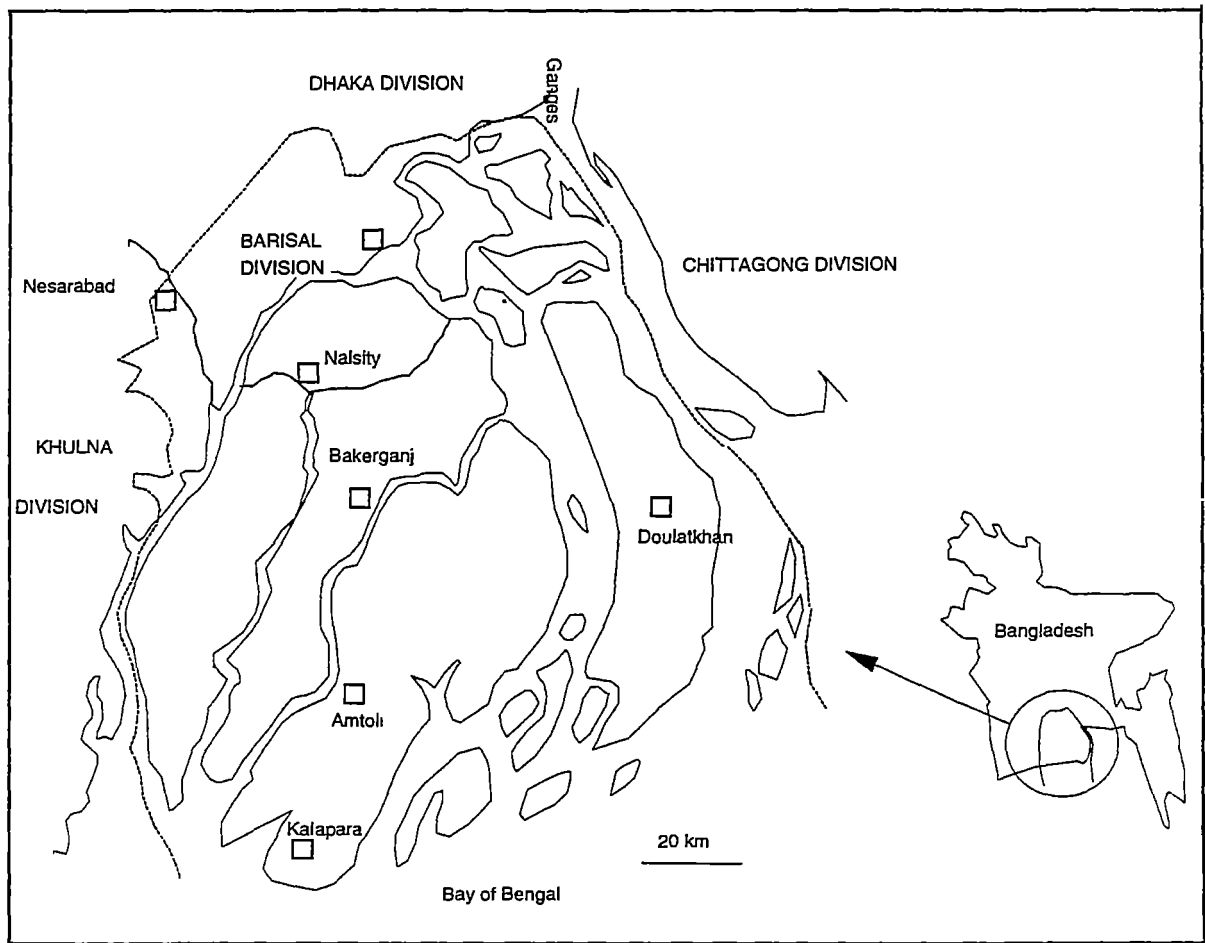
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Dewan Manirul Hoque  
Stockholm in January 1998





## ABSTRACT

The International Drinking Water Supply and Sanitation (1981-1990) decade resulted in almost coverage of water supply in the rural areas of Bangladesh. In spite of this achievement, every year about one third of Bangladeshi children less than 5 years of age die from diarrhoeal diseases. A majority of the people lives in the rural areas and they are poor and illiterate. The most common drinking water supply sources are tubewells. It is the only source accessible for most households, but its effective usability is questionable. As many as one hundred people may use one tubewell. People are using other closer sources for several purposes for their conveniences, which sources are not hygienic. Improving the adequacy and quality of water supply and low cost sanitation is a priority for the public health benefit in the rural areas. Health benefits can't be achieved to any great extent through improved water supply alone; improved sanitation must be implemented simultaneously. Even then health benefits will only result with proper hygiene and this demand's proper hygiene education.

The overall achievements in Barisal region were impressive in the field of drinking water supply, but lag far behind in sanitation and hygiene practices. There is a lack of awareness and lack of co-ordination among the organizations engaged for the benefit of mainly rural households. There is a lack at all levels of co-ordination and co-operation in professional relationship, mechanisms for sharing of experience, provision of appropriate training and skill development. Community participation, especially women's participation strategies, needs to be redesigned to serve the local priorities. In view of the problems identified recommendations are made on possible ways to improve the water supply, sanitation and hygiene education, which includes the need to improve service provision and need for better co-ordination.

**Keywords:** *Awareness, Bangladesh, Co-ordination, Diseases, Hygiene Education, Participation, Water Supply, Sanitation, and Rural Households.*



## **ABBREVIATIONS AND ACRONYMS**

<b>ADAB</b>	: Association of Development Agencies in Bangladesh
<b>BBS</b>	: Bangladesh Bureau of Statistics
<b>BRAC</b>	: Bangladesh Rural Advancement Committee
<b>DANIDA</b>	: Danish International Development Assistance
<b>DPHE</b>	: Department of Public Health Engineering
<b>DTW</b>	: Deep Tubewell
<b>IDWSS</b>	: International Drinking Water Supply and Sanitation
<b>LGED</b>	: Local Government Engineering Department
<b>MCWC</b>	: Maternal and Child Welfare Centre
<b>NGO</b>	: Non-Governmental Organization
<b>O &amp; M</b>	: Operation and Maintenance
<b>STW</b>	: Shallow Tubewell
<b>TK</b>	: Taka (Bangladeshi Currency)
<b>TV</b>	: Television
<b>UHFWC</b>	: Union Health and Family Welfare Centre
<b>UNDP</b>	: United Nations Development Programme
<b>UNICEF</b>	: United Nation International Children's Emergency Fund
<b>USIT</b>	: Urban Sanitation Improvement Team
<b>VIP</b>	: Ventilated Improved Pit
<b>WHO</b>	: World Health Organization
<b>WSS</b>	: Water Supply and Sanitation



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# Chapter I

## 1. Introduction

### 1.1 *Statement of the general problem*

Public health depends on a healthy environment, including clean water, sanitary waste disposal and an adequate supply of healthy food. In this regard ensuring safe water supply and sanitation are the basic requirements for health. It becomes even more critical when cholera threatens the lives of people in poor countries. Since contaminated water is the usual source of cholera infection, all efforts must be made to provide safe drinking water, as well as safe water for cooking, cleaning, washing and bathing. Ways and means of meeting the demands for household water reflect the differing combinations of physical, technical, socio-economic and cultural environments to be found in the world. Good sanitation can markedly reduce the risk of transmission of intestinal pathogens, including cholera vireos. This is especially true where the lack of good sanitation may lead to contamination of clean water sources and food. At the international level, the 1992 Earth Summit has led to a growing global concern for the environment and new political commitment in water and environmental sanitation. Agenda 21's fresh water chapter gives a set of guidelines on issues affecting human relations with the environment, including fresh water and waste management. High priority should be given to observing the basic principles of sanitary human waste disposal, as well as to ensuring the availability of safe water supplies. Health education is the key to public awareness and co-operation. Health benefit cannot be achieved to any great extent through improved water supplies alone; improved sanitation must be implemented simultaneously. Even then, health benefit will only result with proper hygiene, and this demands education. Hence the equation:

Health = Water + Sanitation + Hygiene Education.

An outbreak can be more quickly controlled when people understand how to help limit its spread. Community and service organisations also can be useful in spreading widely health messages through their programmes (schooling, documentary film, leaflet, poster, publicity etc.).

Cities in many developing countries have an appearance of having sign of great wealth. Modern airports and multi-storied offices and hotels full of activities with well heeled politicians, businessmen and international advisers. Those who become really rich usually live in the centre of things and share an affluence in the noisy and energetic activities of city life. On the other hand most people are often worried about what they will eat for their meal. They sleep crowded together, children and parents sharing a tiny room. Most poor people live and work in rural areas.

Urban areas have traditionally been better provided than rural areas with water supply and sanitation services. On a global scale, approximately 71 percent of the urban population (excluding China) have access to drinking water supplies. The availability of most services is higher in urban areas than in rural areas, and drinking water supply is

no exception. At present, only 41 percent of the rural population have convenient access to safe drinking water supplies. With regards to sanitation, approximately 59 percent of the world population (excluding China) were served in 1983. Thus, in spite of rapid urban population increases, the percentage of urban population receiving sanitation services was increased substantially from an estimated 1980 level of 49 per cent. This increase constitutes a reversal of a declining trend observed in the previous 10 years. Unfortunately, with regard to rural sanitation facilities, coverage declined during the first three years of the 1980s from 14 percent to 12 percent. This trend emphasises the need for promoting of sanitation in rural settlements (Habitat 86, p 78).

The large number of communities lacking these services exacerbates the problem of supplying water and sanitation to rural populations in developing countries. Although most rural settlements have developed where water is available, many rural residents still have to travel large distances to a water source. Not all areas have usable groundwater resources. Generally ground water is the most satisfactory form of supply for small communities in terms of both quality and cost - surface water supplies pose serious health problems, particularly in densely populated countries. Until recently rural water-supply schemes were not always designed to provide for basic needs at minimum cost, and the systems installed are often either too sophisticated for rural people to manage or too costly for them to operate. Consequently, many such systems lie idle (Habitat 86, p 82).

With regard to rural sanitation facilities, the level of service provision is not satisfactory in the rural community. Rural sanitation often involves providing a service for people who are underprivileged in all respects. They have little cash. Their time is spent in their fields, or in walking long distances in search of water in dry season and for firewood throughout the year. They are subject to the whims of the weather- to floods and hurricanes and droughts. There are no hospitals or doctors nearby. Many people are ill for a large proportion of the time, suffering particularly from debilitating parasitic diseases and diarrhoea. Infant mortality is high. Much of the sickness is caused by direct contact with excreta, or infection that is carried by flies from excreta. Many are sick because they eat food or drink water, which has been polluted. Most of the rural population are poor and less educated or illiterates so they have lack of hygiene education or health awareness. This trend observed emphasises the need for promoting of sanitation in rural settlements. There is therefore need for a comprehensive health delivery programme that address issues for the improvement of life condition of the rural poor.

## ***1.2 The specific problem***

Bangladesh is a poor developing country with an estimated population of about 111.4 (BBS, adjusted in 1991) million, of whom 80 percent live in the rural area. It has a land area of only 147 570 sq. kilometres with a density of 790 person per sq. kilometre in the fertile delta of the Ganges and Brahmaputra rivers. The country is flat and low lying, rarely more than 15 m. above the sea level. During the monsoon, the great rivers that pass through the country burst their banks. For some two or three months of each year, one third of the country is flooded to depths ranging from 30 cm. to more than 2 m. in a year and sometimes to greater depths. Flood waters and pathogens spread widely and quickly, causing enormous health risks. According to the health ministry more than



250,000 children die annually from diarrhoeal diseases alone. The most common diseases affecting the children are: respiratory tract infection, poliomyelitis, tetanus, goitre, scabies, xerophthalmia, water-borne and water related diseases like diarrhoea, dysentery, typhoid, parasitic infestation, scabies and malaria probably accounting for over 50% of all illness.

The effects of these diseases are especially vicious when associated with malnutrition, which is believed to affect 80% of infants and young children in the country. On the other hand during the dry season water scarcity in the rural areas make the situation worse. Inadequate sources of safe water create a critical situation for these households. Government has therefore required provision of clean water and improved sanitation as well as health promotion as basic elements of its primary health care. In Barisal region, people in the rural areas suffer greatly due to lack of safe drinking water. Though Bangladesh has made very substantial progress in clean water supply, it has so far failed to create a health impact. Barisal region is criss-crossed by numerous rivers and streams and during the rainy season nearly all rivers are in spate, which results in floods and polluted water sources. Water supplies and sanitation facilities are poor and people less exposed to health education campaigns. The reasons for this failure can be attributed to mixed tubewell and polluted water use, indiscriminate defecation practice and very little improvement in personal hygiene practices. Tubewells, which generally are the only source of safe water in the rural areas, are most often than not, inadequate in number for all the inhabitants of the villages. The vast majority of the rural populations are illiterate, surviving on an annual per capita income of less than US\$200. The large number of communities lacking these services exacerbates the problem of supplying water and sanitation to rural households in this region. Most health hazards in rural areas are caused by impure water. So an appropriate source of drinking water supply, proper sanitation and hygiene education are of immense importance for the rural residents.

### **1.3 Rationale of the study**

The rationale of the study has been introduced in my mind because many rural people in Bangladesh do not get proper services of fresh water supply, sanitation and hygiene education/practices. The provision of safe water is of prime importance to public health and in combination with other sanitary measures, is an essential prerequisite to eradicating many endemic diseases. The issue becomes more crucial for a southern division like Barisal. A majority of the population here, mainly the rural people, whose occupation is agriculture, could not have access to safe water, sanitation and hygiene practices. Although there have been provided services and non-governmental organisations are working in this field, they have not reached all parts of the remote area. Moreover the health messages being preached are not yielding any effective impact on behavioural change.

To be able to make effective impacts, education and training programmes should complement investment in infrastructural projects. At the community level, the aims must be to give people a basic understanding of public health practices; introduce them to the need for related infrastructural services to provide them in how to use and maintain the service. This study may treat some important issues, which are overlooked or not identified in the planning process and decision making. Thus, it may provide

some insight/ information and suggest alternative strategies if applicable, for future sustainable infrastructural development or management of projects.

#### **1.4 Objectives of the study**

This study aims to identify the future development of water supply, sanitation and hygiene education at the community level especially for the rural people in Barisal. The overall objective of the study is therefore to evaluate the present domestic water situation regarding supply, use, sources, and hygiene practices among the households and sanitation. The purpose is to examine the benefits of households of water supply and sanitation improvements and their way of dealing with problems related to water, sanitation and hygiene practices. With the household situation in mind, an evaluation will be made of a possible gap between policies, strategies of the authorities and the wishes and attitude of the public. The study results can then indicate or stimulate to some extent if strategies and policies ought to/ could be changed in any way to benefit the rural people. The study was thus guided by the following objectives:

- To examine fresh water supply for the household within the study area.
- To examine present sanitary condition and affordable sanitary facilities.
- To examine hygiene practices/ education in the rural areas.
- To examine the involvement of the Governmental and Non-Governmental Organisations.
- To identify missing information and suggestion which will be important for the future development or improvement.

#### **1.5 Outline of the report**

Chapter two presents the description of the study area, administrative structure, transportation, climate and natural hazards to provide the reader with basic information of the study area.

Chapter three describes the methodology of the study, how the study was carried out.

Chapter four provides the background information of the households in the study area. It will help the reader to understand about the social patterns of the household, including their education, occupation, living condition and health facilities.

Chapter five describes the results of the study. It sums up the collected data from the field visit, which are related to water supply and use, sanitation and hygiene practice.

At the end chapter (six), the researcher take into account all the information summarised and discusses the situations and possible solution for the future development.

## **1.6 Hypothesis**

In relation to water supply and sanitation, diseases from domestic water use and sanitary practice affect rural poor people. The present provisions of services are not good in terms of maintenance and affordability of the people. People are suffering from poor provision of services in terms of water supply, sanitation and hygiene education.

## **1.7 Literature review**

Much has been discussed about the relative importance of water quantity and quality in safeguarding human health and reducing the incidence of communicable diseases. Both are important and complementary. There is no question, however, that the first priority is to provide water. There is no question that breaking the cycle of water-borne disease transmission requires the availability of drinking water that is safe and free of contamination. It should always be kept in mind that an essential priority is to maintain, and where necessary to improve, the microbiological and biological quality of water consumed. Drinking water should be free from pathogenic bacteria and viruses as well as of protozoa and helminths. However this cannot be very effective without linking it to the sanitation issue. It is important for rural people to have a good latrines and improved sanitation for health. It is often rightly said there are three equal elements for improving environmental health: safe drinking water, good sanitation and health education. These three facets cannot be separated. Often drinking water becomes unsafe because of poor sanitation. Health education on understanding of the transmission of disease from excreta - can lead to a demand for good latrines. Equally, provision of good latrines provided without adequate health education or community involvement, can result in some degree of non-use or misuse that completely undermines benefits. These issues are described by Helmer (1989) in his article 'drinking water quality control' in the book "Community Health and Sanitation". He outlines three main types of intervention employed to safeguard drinking-water quality:

- \* The protection of water sources from direct faecal contamination and from secondary pollution caused by leaching from pit latrines, septic tanks, cesspools etc. Because water from small community installations often is not chlorinated, source protection is the first and most important means of providing hygienic drinking water.

- \* The treatment of source water prior to supply is an obvious fallback position where protection measures have failed. It may also be an essential technical intervention to make the water potable at all, in for example the treatment of surface waters from rivers, canals or reservoirs, where the removal of suspended material and pathogenic organisms are vital.

- \* Health education is a mandatory companion to any technology-based intervention, if only to guarantee proper use and maintenance of the facilities. Consumers must be made aware of the links between water and health. The use of safe water supplies has to be explained to prevent people reverting to water of questionable microbiological or biological quality. The contamination of drinking water may not least occur during handling and storage. This factor must be included in educational programmes.

However, further clarify and strengthen the position for water safety, Sandy Cairncross (1995, p 60) discussed Bradley's classification of water related disease transmissions routes in his article 'water quality, quantity and health' presented at the "Safe Water Environments" conference in Kenya in the month of August 21- 23, 1995 (See Table 1). The most important aspect of Bradley's classification for water supply planners was his distinction between water-borne transmission, in which a person is infected by drinking water containing the pathogenic organism, and water-washed transmission which occurs when not enough water is available for personal and domestic hygiene. Other diseases are water-based, being transmitted by aquatic hosts, or transmitted by water-related insect vectors.

Table:1 The Bradley classification of four water-related disease transmission mechanism, transmission routes and the preventive strategies appropriate to each mechanism.

Transmission mechanism	Transmission routes	Preventive strategy
Water-borne transmission	You drink it	Improve water quality Prevent causal use of other unimproved sources
Water-washed transmission	Person-to-person transmission due to lack of water for personal and domestic cleanliness	Improve water quantity Improve water accessibility Improve hygiene
Water-based transmission	Aquatic intermediate host (e.g. a snail)	Decrease need for water contact Control snail populations Improve quality
Water-related insect vector	Transmission by insects which breed in water or bite near water	Improve surface water management Destroy breeding sites of insects Decrease need to visit breeding sites

Source: Feachem et al (1977. p 82)

Table: 2 Environmental classifications of water-related infections

Category	Infection	Pathogenic Agent
Faecal-oral (water-borne or water-washed)	Diarrhoeas and dysentery's	
	Amoebic dysentery	P
	Balantidiasis	P
	Campylobacter enteritis	B
	Cholera	B
	Escherichia coli diarrhoea	B
	Giardiasis	P
	Rotavirus diarrhoea	V
	Sallmonellosis	B
	Shigellosis(bacillary dysentery)	B
	Yersiniosis	B
	Enteric fevers	
	Typhoid	B
	Paratyphoid	B
	Poliomyelitis	V
Leptospirosis	S	
Ascariasis	H	
Trichuriasis	H	
Water-washed Skin and eye infections Other	Infectious skin diseases	M
	Infectious eye diseases	M
	Louse-borne typhus	R
	Louse-borne relapsing fever	S
Water-based Penetrating skin Ingested	Schistosomiasis	H
	Guinea Worm	H
	Clonorchiasis	H
	Diphyllobothriasis	H
	Fasciolopsiasis	H
	Paragonimiasis	H
	Others	H
Water-related insect vector Biting near water Breeding in water	Sleeping sickness	P
	Filariasis	H
	Malaria	P
	River blindness	H
	Mosquito-borne viruses	
	Yellow fever	V
	Dengue	V
	Others	V

B, bacterium; P, protozoan; S, spirochete; M, miscellaneous; H, helminth; R, rickettsia; V, virus. Source: Gleick (1993. p 197)

### **Box: 1 WHO's dual strategy for drinking-water quality**

WHO's dual strategy for drinking-water quality is based on:

First, where the existing infrastructure and resources permit, national drinking water quality standards should be formulated to support countrywide improvement of drinking water quality. The implementation of such standards must be accompanied by practical and feasible surveillance, and with the provisions and means to take remedial action when required.

Second, in rural areas and small communities where standards have little meaning, action plans need to be developed and implemented to improve the protection of water supplies from bacteriological contamination. This requires regionally-or locally based systems linked to primary health care for raising public awareness of the problem and possible solutions, including the implementation of minimal water quality surveillance and remedial measures relying on appropriate technology and community participation.

In translating the strategy into practical action programs, field experience was sought from country initiatives in places as far apart as Peru, Papua New Guinea, Indonesia and Botswana. When comparing the design, implementation and results of these and other projects, common elements emerged which were clearly necessary for any such action program. They included the following:

- \* Careful planning is necessary for surveillance and control, including the design of a workable organisation structure, the assessment of local conditions, and the proper handling and use of information.

- \* Sanitary inspection is a crucial part of any surveillance program and needs to be carried out by trained people at the community or regional level. In many very poor areas, this may constitute the only feasible form of routine surveillance.

- \* In the case of chlorinated water-supplies, the routine checking of residual Chlorine is essential and field methods are provided. This can be applied at the community level with a minimum of training.

- \* Community education and involvement are the mandatory components of an effective surveillance program. The active participation of members of the community is a vital prerequisite for safeguarding drinking water, particularly in remote areas with small and scattered communities. Much of the local health education should be implemented within the framework of primary health care.

Water quality control responsibilities should be shared between water supply agencies and health authorities. The latter, in particular, have overall responsibility for ensuring that all drinking water in their area is safe.

Source: Kerr (1990. p 118).

Cairncross (1990, p 25) wrote in his "Health aspects of water and sanitation" article that excreta disposal can also affect disease transmission in quite complex ways. The infections most directly affected by sanitation improvements are probably the intestinal worms, mainly roundworm, hookworm, and whip worm. Generally, most people have only a few worms or none at all. Those who have a few are not likely to suffer serious symptoms, beyond a mild degree of tiredness or anaemia. The minority, infected by dozens or even hundreds of worms, is at much greater risk of serious illness such as stunted growth, intestinal obstruction or prolapse of the rectum. Moreover, the faeces of this minority will contain much greater numbers of worm eggs and so is an important source of infection for other members of the community. As a rule, children are more likely than adults to be among this minority. Controlling transmission by sanitation measures will have three effects. It may reduce the prevalence of infection to some degree. It is likely to have a more significant effect on the average intensity of infection - the average number of worms per person. Lastly, and perhaps most important of all, it should greatly reduce the number of people with very intense infections.

But, when it comes to training for effective management of water and sanitation facilities, Isely and Rosensweig (1984) suggested some areas for training in their article 'Training non-technical workers for rural water and sanitation projects'. Suggested technical areas in which non-technical personnel can be trained include:

1. Maintenance and repair of hand pumps
2. Development of water sources: springs, shallow wells and cisterns for rain catchment
3. Protection of wells
4. Construction of latrines, both simple and improved
5. Protection of water during transport and storage
6. Solid waste disposal
7. Sludge

To improve the WSS programme, it would be more effective if the hygiene education programme is included into the primary school syllabus. In relation to these activities, an example is given by Dlangamandla, (1988) in his article 'Hygiene and health education in primary schools in Lesotho' about the co-operation between the schools and the Ministry of Health. The provision of improved sanitation in Lesotho's schools is a means of improving the health of all students as well as promoting good hygiene practices among both the students and the broader community as a whole. As a general rule, hygiene is incorporated into the school syllabus in Lesotho. The Ministry of Interior's Urban Sanitation Improvement Team (USIT), through its community section, commits much of its time to teaching hygiene at those schools provided with adequate improved sanitation facilities. The community section becomes involved when the latrines have been completed, just before they begin to be used. They provide user and health education to teachers, who in turn arrange for students to have lessons.

The role of the teacher in emphasising good hygiene and sanitation practices is an important area of discussion. Possible ways in which to integrate health education into day-to-day subjects such as nutrition, language, biology and science are also

considered. Teachers are encouraged to produce their own teaching aids, which their pupils will easily understand. Time spent by USIT members in each school varies between three to seven days depending on the number of pupils, distance, and availability of USIT members giving the health and user education lecture. Since health education on sanitation cannot be taught in isolation, all factors related to water-borne, water-washed and water-based diseases are covered; personal hygiene is also taught.

In Bangladesh the children and women usually carry water on the hip and head. The task of carrying heavy loads over long distances requires a great deal of energy, which comes from metabolised food. The longer the distance and the more difficult the terrain, the greater the quantity of food needed. Dufaut (1988) wrote in her article 'How carrying water affects women's health' about the impact of carrying load on women's health. Carrying water is one of the most arduous of tasks in the rural areas of developing countries; a task which is usually carried out by women and children. Carrying water on the hip may result in health problems such as pelvic damage, especially in children. Women carrying water are frequently exposed to malnutrition, anaemia and water-related diseases. Women are most vulnerable to malnutrition at the end of the dry season when they have to travel even greater distance to fetch water. During pregnancy, the arduous task of carrying water can cause problems with the growth of a foetus. Women have to resume fetching water soon after giving birth, which can affect the quantity and quality of breast milk, making the baby vulnerable to malnutrition.

The problems of the rural people are overlooked and sometimes not observed at all. As we know that Bangladesh has achieved 85 percent of coverage of fresh drinking water supply but the rate of mortality is still high. To achieve the full success of the WSS programme should avoid any kind of bias. Chambers (1983) mentioned that rural poverty is unobserved because of the neglect of some biases by the policy makers or the politicians. He outlined the possible bias six biases, which are closely related to the failure of rural water supply and sanitation programme;

- I) Spatial biases: (Urban, tarmac and roadside) Urban bias concentrates rural visits near towns and especially near capital cities and large administrative centres. Services near main roads are better staffed and equipped. Fuel shortages and costs further accentuate urban bias.
- II) Project bias: Rural development tourism and rural research have a project bias. Project bias is most marked with the showpiece: the nicely groomed pet project or model village, specially staffed and supported, with well briefed members who know what to say and which is situated at a reasonable but not excessive distance from the urban headquarters. "Governments in capital needs such projects for foreign visitors;" (the Comilla project in Bangladesh).
- III) Person biases: (Elite bias, Male bias) Elite is used here to describe those rural people who are less poor and more influential. They typically include progressive farmer's village leaders, headmen, traders, religious leaders, teachers, and paraprofessionals. They are the main sources of information for rural development tourists, for local-level officials, and even for rural researchers. Conversely, the poor do not speak up. With those of higher status, they may even decline to sit down. Weak, powerless and isolated, they are often reluctant to push themselves forward.
- IV) Dry season biases: The wet season is also the unseen season. The rains are a bad



time for rural travel because of the inconveniences of floods, mud, landslides, broken bridges and getting stuck, damaging vehicles, losing time, and enduring discomfort.

- V) Diplomatic biases: Poverty in any country can be a subject of indifference or shame, something to be shut out, something polluting, something, in the psychological sense, to be repressed. Courtesy and cowardice combine to keep tourists and the poorest apart.
- VI) Professional biases: Finally, professional training, values and interests present problems. Sometime they focus attention on the less poor: agricultural extension staff trained to advise on cash crops or to prepare farm plans are drawn to the more progressive farmers; historians, sociologists and administrators, especially when short of time, can best satisfy their interests and curiosity through informants among the better-educated or less poor.

### **1.8 *Limitation of the study***

In relation to the objectives it was very difficult to identify the accurate/perfect results of the study sample because of only 168 household were interviewed among five thanas of total 38 thanas. Anyhow all the rural peoples life-style, socio-economic condition, occupations are almost the same. It was not the researchers intention to limit the sample to this extent but the major problem was lack of enough funds. No research funding had been allocated for the field studies. The researcher has managed the field study with the little amount of money from the family grants and time was also limited for such kind of study to examine or get the correct picture of the whole Barisal area.

The researcher tried to collect data by interviews from an open-ended questionnaire, which could not touch on some issues or was missing some issues or was sometimes too difficult to understand for the respondent. It might have happened that respondents were afraid or shy to give appropriate answers or misunderstood the purpose of the study. Thus they tried to avoid the real answers. But the researcher was conscious about respondent's problem. Apart from these identified problems of the study, the interview session proceeded well.



## Chapter II

### 2. Description of the area

#### 2.1 *The Area and its population*

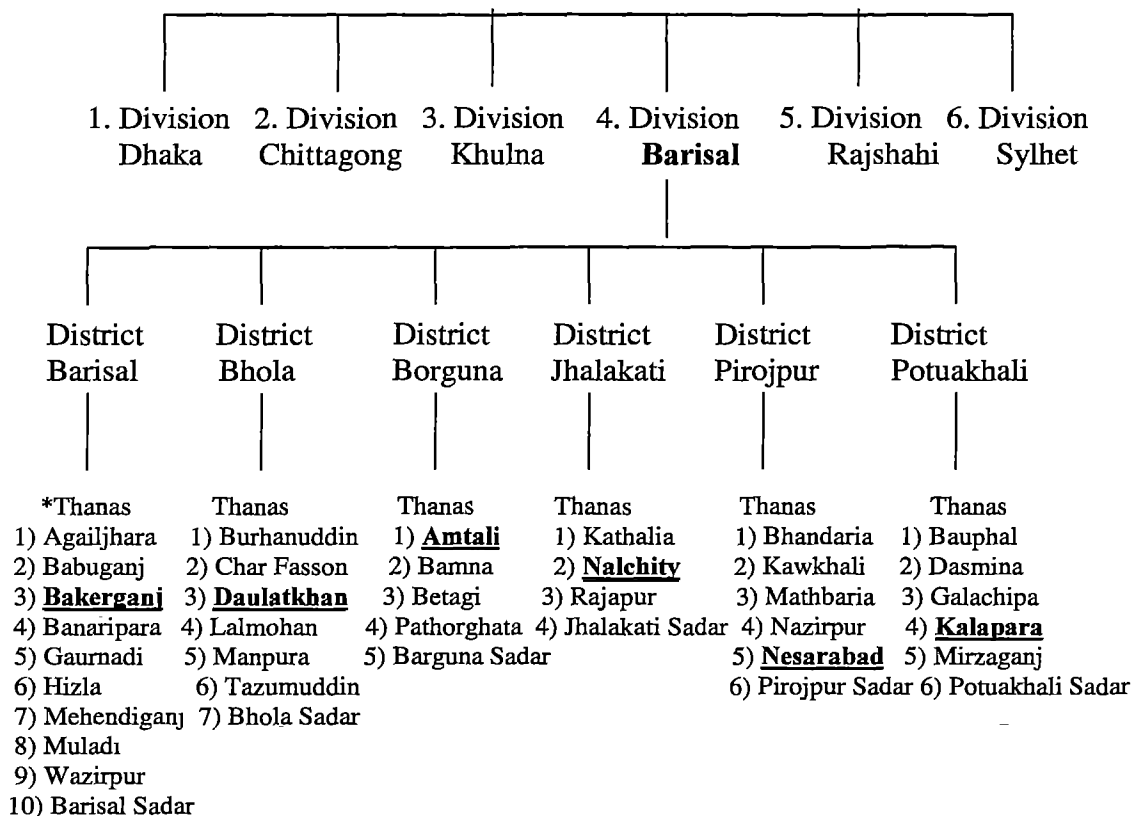
The population of Barisal division is around 7 757 000 and households are 1 422 000 and the average size of the household are 5.5, and the area is about 13 297 sq.km. according to Bangladesh Bureau of Statistics (BBS). The characteristics of the people of Barisal are almost the same as in the other parts of Bangladesh. Some differences can be found between the urban and rural area according to occupation and life-style. Bangladesh has been a melting pot of peoples and cultures for a very long time. Peoples from Myanmar and the Himalayas, Dravidians (the original inhabitants of the subcontinent) and the invading Aryans made up the first blend of people here. With the arrival of the Mughals, people from all over the Islamic world settled.

The Dravidians, with their racial origins in the Deccan Plateau, are mainly Hindus and constitute about 12% of the population in Bangladesh. The Muslims, who make up 87%, are of Dravido-Aryan origin. The original tribal people still exist, mainly in the Chittagong hill tracts, though they now number less than 1% of the total population. Tribal people are also living in southern part of Barisal division. Many of the tribes have been converted to Christianity, although animism still strongly influences their beliefs and practices. The Tibeto-Burmese inhabitants are mainly Buddhists and less than 1% of the population is Christian. The Muslims and Hindus have a cultural affinity with West Bengal and speak Bengali, while the Buddhists have their own distinct culture and dialect related mainly to that of Burma (Myanmar) and the tribal culture of eastern India.

#### 2.2 *Administrative structure of Bangladesh*

For administrative purposes, the country is divided into six divisions. Divisions are divided into districts (total 64 districts). Districts are divided into thanas (Total 490 thanas). Thanas are divided into unions. A union is divided into mauza (villages). The head of the division is "Divisional Commissioner". The head of the district is "Deputy Commissioner". The head of the thana is "Thana Nirbahi Officer". The Civil Service authority appoints the head of the division and thana and they are responsible for their own areas. The head of the union is Union Parishad Chairman, elected by the inhabitants (18 years old and above) of the union for every five years /four years.

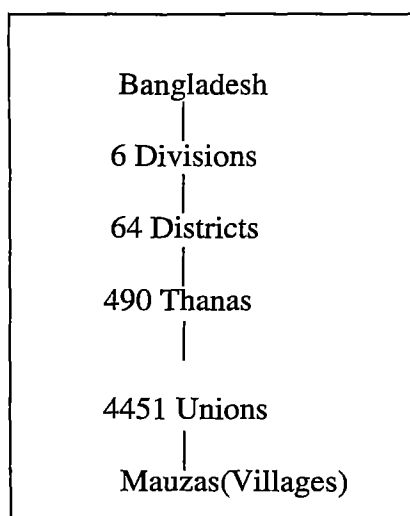
## Bangladesh



\* Thana's are divided into unions.

\*\* Every district has its own thana which is known as "Sadar thana"

### Box: 2 Administrative unit hierarchy



Source: BBS (1996)

## 2.3 Geography

Bangladesh is very flat and the rivers are correspondingly vast. It is surrounded to the west, north west and east by India, and shares a south eastern border with Myanmar. To the south is the Bay of Bengal. The great Himalayan rivers, the Ganges and the Brahmaputra, divide the land into six major regions, which correspond to the six governmental divisions: north-west (Rajshahi), south-west (Khulna), **south central (Barisal)**, central (Dhaka), north-east (Sylhet) and south-east (Chittagong). The Sundarbans, a vast area of the coastal forest touched Barisal and Khulna division. The capital of the new Barisal division, Barisal is a major port city.

Barisal division is largely isolated from the rest of Bangladesh. The area of Barisal division is 13 297 square kilometre comprising of 38 thanas. Rivers canals are the most important geographical feature in Barisal. These rivers have been described as young and migratory and even in the last 100 years there have been massive changes of course. Many small lakes and ponds are scattered around the Barisal division.

## 2.4 Climate

The climate is subtropical and tropical with temperature ranging from an average daytime low of 21 degree centigrade in the cold season to a top of 35 degree centigrade in the hot season. Three-quarters of the annual rainfall occur between June and September. 90 percent to 95 percent humidity in this season is almost unbearable for some travellers. There are three main seasons: the monsoon or wet season from late May to early October; the cold season from mid-October to the end of February; and the hot season from mid-March to mid-May. There are two cyclone seasons - May to June and October to November. Six seasons are generally considered. In the cold season the weather is drier and fresh and the days are usually sunny with clear blue skies. Annual flooding during the monsoon season is part of life in Bangladesh.

### 2.4.1 Natural Hazards: floods, Droughts, Cyclones and Tornadoes

Natural hazards affect the lifestyle of rural people. People lose their houses, crops, and livestock's. Floods are one of the main reasons of water contamination. Flooding is very much a part of the normal cycle of the seasons. Experience from Bangladesh show that there are four types of floods. Such as:

Flash floods characterised by sharp rise and fall in water levels causing high flows from nearby hills/mountains that damage crops and property.

Rain floods due to high intensity rainfall over Bangladesh. Due to inadequate drainage capacity, such rainstorm of 3 to 10 days' duration sometime cause localised floods inundating crops, houses and roads.

Floods arising from storm surges due to cyclone in the coastal areas.

Monsoon floods from over spilling of rivers especially the major rivers, which usually rise slowly. Major floods occur when the peak flow of Ganges coincides with that of Brahmaputra.

**Droughts** of various intensity occur in almost all parts of Bangladesh during the eight months from October to May. Droughts are particularly severe in the north-western and south-western parts of Bangladesh where monsoon rain occurs for about three months as compared to 5 months in the north-east.

The coastal regions are subjected to damaging cyclones almost every year. The loss of human life and property has at times been very great. The severe killer cyclones develop during spring and autumn, of which 75% occurs strictly from 15<sup>th</sup> April to 15<sup>th</sup> December. Storm surge associated with tropical cyclones is one of the most serious problems in the coastal areas. Records show that world's most pronounced storm surge disasters are observed in the Bay of Bengal.

**Tornadoes** are more common in the central part of Bangladesh and 76% of them occur during pre-monsoon period. (Task force report 1991, p 63)

## ***2.5 Communication network***

The communication system of Barisal district with the capital city Dhaka consists of air connections, main roads and waterways but other districts in Barisal division have not air connection. Bhola district is also isolated from other districts and it has only waterways with the capital city and some other districts. Some thanas in this division are also isolated from rest of the districts and the journey is also uncomfortable.

In Barisal region bus passes through other districts via Barisal town. The principal Dhaka-Barisal overland route now passes via Mawa (the Padma river crossing) and Madaripur, but people can still also take buses via Aricha and Faridpur, which is longer. The trip takes eight to ten hours. There are also direct connections westwards to Khulna (another division); the trip, which involves two ferry crossings, is via Pirojpur and Bagerhat, and takes at least eight hours. Buses travelling south to Bakerganj (18 km) and Potuakhali (40 km). From Potuakhali there are buses to Borguna, Galachipa and Kalapara. The journey by boat from Dhaka to Barisal takes 12 to 13 hours.

Rural infrastructure is especially prone to be captured by local dominant classes because it cannot be directed so purposely. Even when compared to a programme of new technological inputs in agriculture where distribution has been skewed negatively in terms of class and region. Embankments may enhance the value of some land, but create water logging of other land as a result; drainage similarly may dry out some land too soon in the season and affect crops; it may also increase down stream flow and cause flooding elsewhere.

Choices in location of roads, grade of materials, width, height of embankment, use of bridges all affect the kind of transport, carrier and freight, therefore affects the distribution of opportunities between bus/truck, rickshaws, carts, walking, and boats for obtaining value added benefits from transportation. Local populations are therefore being reorganised in terms of opportunities. Roads sometimes compete with rivers as means of transport. Even when river transport, choices exist (Wood 1994, p 310).

Table: 3 Communication and Road availability in the study area

District and Thana	Soil	concrete/ Brick	Water way
Pirojpur, Nesarabad	y	y	y
Potuakhali, kalapara	y	n	y
Borguna, Amtoli	y	y	y
Bhola, Doulatkhan	y	n	y
Barisal, Bakerganj	y	n	y
Jhalokathi, Nalsity	y	n	y

Source: Author's field survey

Communication in the rural area is not so easy. From the thana centre to remote areas, roads are generally dirttracks which are made of soil. The researcher found some roads only in Nesarabad and Amtoli that were made of concrete and brick during the field survey (See table 3). Waterways were found but the transport is only man-driven boat and few engine boats exist. Boats are used for transportation during the rainy season because soil made road is full of mud or difficult to carry any transport on.

## ***2.6 Communicable diseases in the study area.***

Communicable diseases are the major health hazards in these regions. Poor nutrition and sanitation fostered the spread of infectious diseases. Cholera, diarrhoea, measles, diphtheria, pertussis, tetanus, and poliomyelitis- and parasitic diseases such as malaria, filariasis, and helminthiasis are responsible for widespread illness and numerous deaths. Young children suffered disproportionately from diseases. Major killers of young children are severe diarrhoea and neonatal tetanus caused by unsanitary treatment of the umbilicus.

## ***2.7 Water supply and sanitation technology availability***

A variety of technologies have been developed to serve in different hydrological conditions as well as to keep cost as low as possible. The primary tube well/ pump technologies in rural areas include shallow tubewells (STW), deep-set handpumps (DS) such as the Tara, and deep tubewells (DTW). Shallow tubewells are easily sunk and use the well-known No. 6 handpump. They are relatively inexpensive to install and maintain, but can only lift water from about 7 meters below ground level.

Deep set handpumps are needed where water tables are eight or more meters below

ground level. A cheaper and less complex handpump called the Tara, which is locally produced, was developed and fielded in the mid-1980s. Deep tubewells are usually used in saline areas where drillers go deep to find fresh water aquifers. They are expensive and take much longer to construct than shallow tubewells. Although the price of tubewell is not so high, nevertheless it is difficult to bear the cost of a tubewell for an individual household because almost every household in the rural area can't save money or they don't have enough money. The price of a shallow tubewell is about Tk. 700 and the price of a deep tubewell is about Tk. 2000.

There is variety of latrines available. Low cost on-site options in use are:

- 'Home-made' Latrine (HML), consisting of an unlined pit covered with a platform with a hole in it. It is cheap and simple to build and maintain, and used in urban and rural areas.
- Ventilated Improved Pit (VIP) with lined pit- the vent controls flies and creates the updraft removing smell. It is cheap, simple and sanitary, but not in wide use.
- Water Seal Latrine with concrete platform, pan and single lined pit. When the pit fills up, a new pit has to be dug and superstructure relocated, or the pit has to be emptied. It is simple and sanitary and used in the urban and rural areas.

The most widespread version in use for rural sanitation are the 'home-made' and single pit, water seal latrines. The pit is lined with up to five concrete rings, the slab is either of ferrocement or reinforced concrete, and water seal pan is of ferrocement. Burnt clay rings are used where available. Improper maintenance of water seal latrine leads to water seals clogging which users are unable to clear. This often leads to users breaking the water seal. Thana Department of Public Health Engineering (DPHE) produced and sold water seal slabs in combination with one to five pits rings. The price of one slab and one ring is only TK.125 (1 US\$ = 45 TK.).

There is also available (easy to build) burnt clay rings and they are very cheap and durable. One burnt clay ring of 6 inches height cost TK. 10-15. The platform can be made of bamboo or water seal slab.

## ***2.8 Water facilities in the rural area***

Surface water is the traditional source of water supply. Well water is favoured for drinking and stored in pitchers. For bathing, laundry and washing of cooking utensils, use of pond, ditch, flood and river water is most convenient. Although water is normally abundant, much is polluted with human waste.

On the other hand, safe water is a basic health requirement. Access to safe water facilities is critical for rural women, because they are the principal managers of domestic water needs and family health care. But access to such facilities is inadequate in Bangladesh, partly because of extreme poverty in the rural areas, where rural households are too poor even to afford the subsidized community tubewells. In addition, society has traditionally attributed low priority to the appeal for safe water supply.

Bangladesh Government has undertaken programmes to expand safe water facilities



beyond larger cities. Estimates of safe water coverage vary considerably. Coverage can be equated with direct “ownership” of facilities or the right of “access” of non-owners to tubewells in homes of neighbours or in public institutions like schools, office buildings, or mosques. Based on the concept of ownership, the Government estimates that 43 percent of the rural population had access to safe water in 1986. For the same year, the World Bank estimates that 50 percent of the rural population had safe water.



## Chapter III

### 3. Methodology

#### 3.1 Study design

The study was designed to collect data for this thesis from primary and secondary sources. For the primary sources of data, the researcher used some instrument like sampling procedure, questionnaire for interview, field survey and observation of the real situation. For the secondary sources, data were obtained from the library and personal collection. Secondary data were written document, which provided the researcher useful references and supported practical insight and knowledge.

#### 3.2 Sampling procedure

One thana (administrative unit) was chosen by simple random sampling techniques from each district of Barisal division which comprise six districts. After selecting the thanas the researcher visited the remote (rural) area of each thana. The households were selected randomly when he was walking in the rural areas. Interviews were conducted with those who were at home. Thus, totals of 168 households were interviewed from the six thana's (figure number of household).

Tables: 4 Household from different area.

Districts and Thanas	Number of Household
Pirojpur, Nesarabad	25
Potuakhali, kalapara	26
Borguna, Amtoli	31
Bhola, Doulatkhan	31
Barisal, Bakerganj	27
Jhalokathi, Nalsity	28
Total household	168

Source: Author's field survey

### ***3.3 Questionnaire***

A questionnaire was made for interviewing the households to keep in mind the objective of the study. For this purpose some literature were reviewed to touch every aspects of the objectives. The questionnaire was used for the interview of the household. Some basic information was collected on the characteristics of each household. Information was collected about the dwelling itself, such as source of water, type of toilet facilities, personal hygiene practices etc. The questionnaire was open-end which was simple to understand for the household. It was prepared as a rough draft for the purpose of getting an improved version, and then it was discussed with the local supervisor to giving due thought to the appropriate sequence of putting question. The questionnaires were translated into Bengali.

### ***3.4 Field survey***

Field surveys were made for interviewing the households accompanied with four local students from Brajo Mohon College (Barisal). They helped me during my survey period by showing me the unknown places and their aim was to gather knowledge for their own future research. The interview approach was friendly and informal. Initially friendly greetings in accordance with the cultural pattern of the interviewed were exchanged and then the purpose of the interview explained. The researcher controlled the course of the interview in accordance with the objectives.

### ***3.5 Observation***

Observations were made directly when the researcher was walking around during the period of survey. In the observation method Kothari (1985) described, “under the observation method, the information is sought by way of investigator’s own direct observation without asking from the respondent”. To remember the situation of the area and condition of the household, some pictures were shot. The researcher was conscious about the study and tried to find out some other relevant information. Sometimes households tried to hide the real information. The researcher did not ask some questions, as they were sensitive or not understandable to the respondent. He also noted down some important information, which are relevant to the study.

### ***3.6 Interview with public health and NGO officials***

For the purpose of the study interview were made with the local public health engineer and NGO official. The view was to know the situation of the water supply and sanitation condition and how they deal with the situation.

## Chapter IV

### 4. Social patterns of the household

#### 4.1 *Community characteristics*

In the rural community the basic social unit in a village is the family, a generally patrilineally extended household and residing in a homestead. The individual nuclear family is often submerged in the larger unit and might be known as the house (ghar). Above the bari (two or more houses) level, patrilineal kin ties are linked into sequentially larger groups based on real, fictional, or assumed relationships.

A significant unit larger than that of close kin is the voluntary religious and mutual benefit association known as the “the society” (samaj). An informal council of samaj elders ( matabbars or sardar) settles village disputes. Groups of homes in a village are called paras, and each para has its own name. Several paras constitute a mauza, the basic revenue and census survey unit. Factional competition between the matabbars (local elites) is a major dynamic of social and political interaction.

#### 4.2 *Family, Household and kinship*

Family, household and kinship are the core of social life in Bangladesh. A family group residing in a bari would function as the basic unit of economic endeavour, landholding, and social identity. A married son generally lives in their parent’s household during the father’s lifetime. However, sons usually build separate houses for their nuclear families. The death of the father usually precipitates the separation of adult brothers into their own households. Patrilineal ties dominates the ideology of family life, but in practice matrilineal ties are almost as important. Relatives are often visiting each other and stay also for a while in the house of the relative.

#### 4.3 *Values*

Values generally depend upon society (urban and rural), religion, occupation, social stratification, gender, education etc. A rural society has its own values that are a little bit different than the urban society. Religious values are dominating the different religious group of people in their daily life in society. Islamic rituals and tenets varies according to social position, local, and personal consideration. Villagers call on the mullah for prayers, advice on points of religious practice, and performance of marriage and funeral ceremonies. Religion can best be understood in a regional context, the cast system, beliefs, rituals and festivals of the Hindus. Hinduism admits worship of spirit’s and godliness of rivers, mountains, vegetation, animals, stones or disease. Ritual

bathing, vows, and pilgrimages to sacred rivers and mountains, are important practices. Social class distinctions are mostly functional, however, there is considerable mobility among classes. Traditional Muslim class distinction had little importance in this region. However, the Hindu society is formally stratified in the caste categories.

The practice of purdah (the traditional seclusion of women) varied widely according to social milieu. The segregation of the sexes extended into social groups that had rejected full purdah as a result of modern education.

Women, in custom and practice, remains subordinate to men in almost all aspects of their lives. Most women lives remains centred on their traditional roles, and they have limited access to markets, productive services, education, health care, and local government. Government and NGOs have taken programme for empowerment of women and the situation is changing now.

#### ***4.4 Housing characteristics***

In the rural area most of the people are poor. They have built their houses within their ability. Almost every house is made of wood, bamboo, tin, straw etc. Buildings (house made of brick, cement, rod and sand) are rare in the rural area. Houses, made of wall with tin roofing are also common in the rural area (it depends upon the ability of the household). Tin is the most common roofing material in Bangladesh. In urban areas around 30 percent of households live in dwellings with cement, concrete or tiled roofs, while in rural areas, bamboo or thatch is the most common roofing material after tin. Earth (soil) flooring is almost universal in rural areas.

The size of houses is also small and they are crowded. Households usually contain four to ten members. Electricity is not used in every house. They usually use fossil fuel mainly kerosene oil, fire-wood, straw and dried cowdung etc. for their cooking and lighting purpose. The kitchen is near or attached to the house. During the dry season some household cook in the open space near to their house and during the rainy season they use only roof to protect from the rain water.

Latrine is a little bit far way from their houses. All households don't have a hygienic toilet. Hygienic toilets include septic tank/modern toilets, water- sealed/slab latrines and pit toilets. Septic tank/modern toilets are the hygienic toilets in the urban areas, while in the rural areas, pit latrines and water-sealed/slab toilets are the common hygienic toilets. In the rural areas hanging toilet still exists and some households have no toilet facilities at all.

Tubewells are the main source of drinking water, however, every household has not a tubewell. Other sources of water are ponds, canals and rivers. Some households have tubewells; other people share it if the relationship is good with their neighbour. Pond is a common source of water in almost every village. Some villages have also a canal as a water source. Households usually use ponds and canals for their bath. Some households have also bathroom near to their house. They collect water from a pond or a canal or a tubewell and use it for bathing purpose. Some households also take their bath in the pond or canal and change their clothes in their bathroom.

Energy crises in the rural areas are common. The government is trying to distribute electricity to almost every rural area, but in reality at the national level the demand is higher than the supply of electricity. We found that only seven households located in the Nesarabad rural area are using electricity (see table 5). Most of the household use oil (kerosene) for their light at night. Some family use kerosene for cooking purpose. In general rural people use wood, straw, and cow dung for cooking purpose.

Table: 5 Type of energy use of the household

District and area	Electricity	Oil	Wood	Straw	Cow dung
Pirojpur, Nesarabad	7	18	22	12	2
Potuakhali, kalapara	no	26	15	16	9
Borguna, Amtoli	no	31	24	21	11
Bhola, Doulatkhan	no	31	25	25	3
Barisal, Bakerganj	no	27	23	20	2
Jhalokathi, Nalsity	no	28	23	9	4

Source: Author's field survey

#### ***4.5 Occupation and employment***

Occupations differ based on people's various access to land and entrepreneurial employments. Agriculture is the main occupation in the rural area of Bangladesh. Around 75 percent of the people are involved in agriculture, forestry, fishery and the rest of the others are involved in different occupations such as daily labour, business, uncertain work and employee.

Activities are divided into agricultural and non-agricultural. Sometimes the labour is also involved in both activities. The use of labour in crop operations are ploughing, puddling, seedbed preparation and transplanting. About 95 percent of the labour days used for winter rice production are provided by male labour. Female labours are mainly used for post-harvest operation such as threshing, drying and cleaning of the crop.

The two major sources of labour were family and hired labour. The wage rates are more or less equally fixed in a locality; daily wage rates don't differ significantly. In general employees works in their nearest town or area. With employees is meant those who are provided by government, company, firm etc. They come to their workplace and go back home everyday. Some of them work far way from home and go back home only during the vacation.

Table: 6A Income and occupation of the household between different income groups

Income group (in Taka**)	Farmer	Labour	Business	Employee	Uncertain work	Unemploy ment
<1000	12	4	2	1	2	1*
1001-2000	32	15	6	2	6	
2001-3000	20	11	12	7	4	1*
3001-4000	5	4	5	2	2	
4001-5000	3		3	2	1	
5000>	1		1	1		
Total	73	34	29	15	15	2

Source: Author's field survey

Note: -\*respondent doing nothing but maintained by son's income

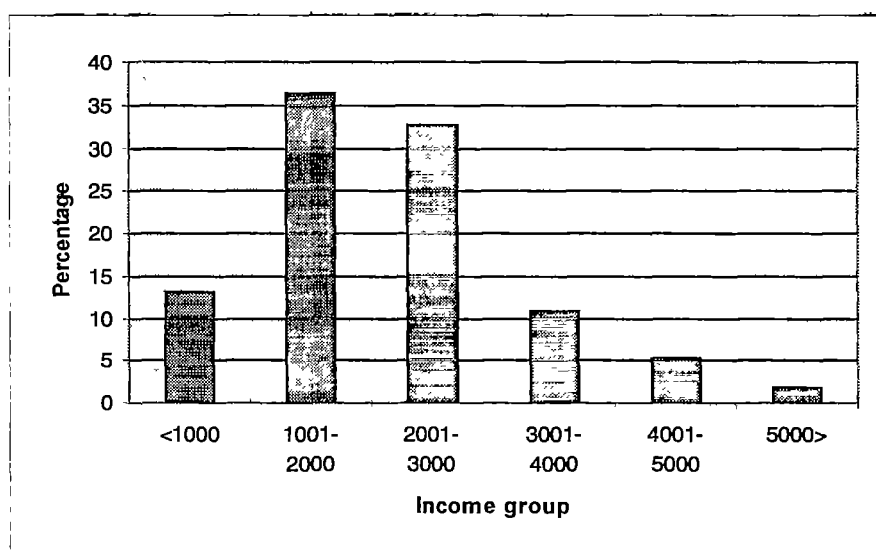
\*\* Taka 45 = US\$ 1

Table: 6B Comparison between different income group

Income group	Number of household	Percentage
<1000	22	13,1
1001-2000	61	36,3
2001-3000	55	32,7
3001-4000	18	10,7
4001-5000	9	5,4
5000>	3	1,8
Total	168	100

Source: Author's field survey

Figure: 1 Percentage of different income groups





The survey showed that most of the rural people's occupation is agriculture. The people of the rural area are poor. 82,1 percent of people's income is within TK. 3000 (amount of money). Among them 36,3 percent people's income within Tk.2000 and 13, 1 percent's peoples income is around Tk.1000 (see table 6B). When the researcher was conducting interviews that period of the year was good for earning because farmer were involved with farming activities. On the other hand they don't have figures of their income. They earned money and spent their money for their large family. According to the BBS the size of a household in Barisal is about 5.5. The size of a household in the urban area is small and the size of a household in the rural area is large. The researcher observed that some household sizes in the study area is six to twelve members. So it is difficult to maintain their family with this amount of money and sometime the expenditure is more than their income.

#### ***4.6 The role of women***

Women have always played a vital role as both water suppliers and water managers. They are solely responsible for collecting water, as water is needed by the family for drinking, domestic purposes, personal hygiene and sanitation as well as for the many processes involved in food production. As managers, women are responsible for storing water and deciding on its use. Usually water is carried on the hip from the water sources.

Women, being the main health care providers for the family, often have to bear the dual burden of dealing with their own ill health while simultaneously providing care for other family members.

Women, as the primary water carriers, managers, end-users and guardian of household hygiene, play a paramount role in water and sanitation management. By virtue of their domestic functions, they are in constant contact with polluted water and are therefore the group most vulnerable to water- related diseases. Women of rural Bangladesh spend eight or more hours a day working with polluted water. Their water-centred activities include preparing and cooking food, cleaning utensils, washing clothes, cleaning the house, disposing of babies faeces, etc.

Women consider children faeces to be harmless and defecation anywhere is therefore acceptable; however, they are unaware that millions of children die every year because faeces are not disposed off in a sanitary way.

In a conservative culture like ours, it is not acceptable for men to talk with women about matters of health and personal hygiene. Nor can a man enter women's home as freely as other women can.

Local women's customs, preferences and traditions are not considered in choosing the technical design and location of projects. In our culture women need more privacy than men do. Women prefer the tubewell to be located near to their home, so that it is convenient and time saving to collect water. Rural traditions do not permit women to use the same sanitation facilities as men and latrines are not appropriately designed to fit the customary habits.

#### 4.7 Education

Education is a key determinant of the life style and status of an individual in a society. It affects almost all aspects of human life, including demographic and health behaviour. Educational attainment has strong effects on infant and child mortality and morbidity and issues related to family health and hygiene. During the study period we enlisted people who can write and read their names. Some of them told us they are educated but they can write only their signature. Using this criteria to judge if the respondent is educated, the wife is not in some cases because the study (BBS, 1996) shows that the women literacy rate is lower than the man.

According to Bangladesh Bureau of Statistics, literacy rates of population of seven years and above age (BBS 1996, adjusted in 1991) in Barisal division of male and female are 44.5 percent and 34.5 percent. Present drop out rate in education is high in Bangladesh. Primary school enrolment ratio (percent) in the rural area is 73.4 and primary school drop out rate in the rural area is 17.3 (Demographic and health survey, 1995). Parents can't support their children to continue their education. Most of the rural people are poor. Children also try to help their parent at the work place and sometime they are hired as child labour. Education is free for the whole primary school level. To encourage women education in Bangladesh, the government has allowed tuition fee free education at the secondary school level.

Table: 7 Respondents literacy rate\*

Area(District and Thana)	Educated		Uneducated	
	No.	%	No	%
Pirojpur, Nesarabad	22	88	3	12
Potuakhali, Kalapara	17	65.4	9	43.6
Borguna, Amtoli	23	74.2	8	25.8
Bhola, Doulatkhan	11	35.5	20	64.5
Barisal, Bakerganj	16	59.3	11	40.7
Jhalokathi, Nalsity	17	60.7	11	39.3
Barisal Division	106	63.1	62	36.9

Source: Author's field survey

\*This literacy rate includes who can sign only their name.

Almost every thana has a primary school, a secondary school, a college and a girl's school in the centre. Some thana's have more than one primary and secondary schools. Some places also have madrasas (religious education). At the village level primary and secondary school is available but not in all villages. For higher studies students have to go the district town or big cities.

The study result shows in the Barisal region that the educated respondent rate is about 63,1 percent and the uneducated respondent rate is 36,9 percent (see table 7). Among the respondent we counted as educated those who can sign their name. Among the household, if the respondent is educated, his/hre wife/husband may be educated/uneducated. Here we counted only respondent's educational quality. In Bakerganj, one household complained that there was a primary school near his house but he could not send his children to the school for poverty.

#### ***4.8 Health care and facilities***

Medical facilities remain extremely scarce. The Ministry of Health and Family Planning is responsible for development and implementation of national health and population policies as well as administration, co-ordination and management of the health care and family planning service delivery system. Within the Ministry, two directorates - the Directorate of Health and the Directorate of Family Planing, are responsible for the technical aspects and service delivery system. The government's policy objectives are health care services for all, primarily through the construction of health in rural areas and the training of health care workers. The strategy of universal health care by the year 2000 had become accepted, and governmental efforts toward infrastructural development included the widespread construction of rural hospitals, dispensaries, and clinics for outpatient care. Program implementation, is limited by severe financial constraints, insufficient program management and supervision, personnel shortages, inadequate staff performance, and insufficient numbers of buildings, equipment, and supplies.

Medical education and training is provided by national ten medical colleges and postgraduate specialized medical institutes. Government health care facilities in rural areas consisted of Thana health centres, union-level health and family welfare centres, and rural dispensaries. Thana health centre in the mid-1980s typically had a thirty one bed hospital, an out patient service, and a home service unit staffed with field workers. There are also Maternal and Child Welfare Centres (MCWC) providing service at the district and Thana level. In 1983 the Government of Bangladesh had decided to merge the functions and staffing patterns of rural dispensaries and UHFWCs (Union Health and Family Welfare Centres) and at the union where UHFWCs did not exist to upgrade rural dispensaries to UHFWCs. This process is still not complete and all unions do not have rural dispensaries. Some of the services, are largely non-operative because of staffing problems and a lack of support services. Programming and priorities of the non-governmental organisations are loosely co-ordinated.

In spite of governmental plans, the gap between rural and urban areas in the availability of medical facilities and personnel remains wide. During the monsoon season and other recurrent natural disasters, the already meagre services for the rural population are

severely disrupted. In the rural area, practice of traditional medicine is also very common. Traditional medicines such as homeopathic, ayurvedic and unani drugs are often used because it is available and cheap. Village doctors (accessible medical practitioner) are also available at the local level however without appropriate medical knowledge or training. On the other hand people feel the problem that they don't have appropriate medical services available. Most of the government appointed physicians are working in the thana health centre and most them are more interested to look after the patient privately.

## Chapter V

### 5. Results

This chapter provides an analysis of the data, collected from the field and discusses the results of its findings in relation of the objectives of the study. It will focus on water supply and uses, sanitary facilities, types of latrine by the users and problems from the latrine, hygiene practices among the rural people. It will also focus on the role and performance of NGOs.

#### 5.1 *Water supply and uses*

Fresh water supply and its uses should be the top priority in human's everyday life. The International Drinking Water Supply and Sanitation Decade (1981-1990) resulted in almost a universal coverage of water supply in the rural areas of Bangladesh. Today, 85 percent (compare to international access presently 41 percent) of rural population is claimed to have access to safe drinking water supply at a public operating tubewell (Pickford 1996. p 143). In reality, people are getting and using water in difficult ways or not perfect ways. It is also vulnerable for their livelihood or they have to pay more in a hidden way. It has never been a tradition of the country that the rural people buy drinking water. In this part we will see how people are getting drinking water, how they use water and for what purposes, such as cooking, washing, bathing water and how long distance they have to go for collecting water in the Barisal region.

##### 5.1.1 *Water source of the households*

The rural households of Barisal region collect water from various sources, such as tubewells, ponds, canals etc. Tubewells are the only sources of safe water for the household. The number of tubewells for the whole village are in general not sufficient to fulfil the demand. Some of them are private owned and some of them have been installed by the Department of Public Health Engineering (DPHE) of the government of Bangladesh.

The village households usually prefer to use tubewell water for the purpose of drinking water, while pond or canal water is used for other purposes like cooking, washing and bathing. Ponds are very small in size. Canals are also an important source of water for household use in the villages. Washing and bathing in the pond is a common sight for both men and women. Sometimes ponds and canals are used for domestic animals bathing purpose also.

##### 5.1.2 *Water storage*

All households visited had some form of water storage containers. Water is stored for drinking and cooking purposes. It depends upon their water sources. If the water source

is near to their home, they store a small quantity because it is easy to carry. If it is far away from home, they store an adequate quantity of water for their drinking purpose because the carrying of water is a time-consuming matter. Unfortunately, many water pots are not well maintained. They are neither placed on elevated holders nor regularly cleaned inside and outside. Often the water pot is left completely open or the covering is inadequate. Hands can come into contact with the water whenever it is removed. When stored water is taken from the same vessel for drinking and all other domestic uses, including washing after defecation, it is likely that people will be exposed to pollution. Water is also frequently removed from the storage vessel by all the members of the extended family who live together and by visitors from outside. The unwashed hands of children and sick people can easily contaminate such water with faecal matter or infectious nasopharyngeal mucus. Water in open pots is also affected by all kinds of wind-borne pollution and may be defiled by thirsty pet animals. Poorly maintained storage of water is a common source of diseases.

### 5.1.3 Access to drinking water

Access to fresh drinking water is in general satisfactory in the rural area. According to the respondents, they are collecting drinking water from the tubewell and most of them are collecting their drinking water from a shared source such as one tubewell for two to twenty household or more than that. Few households have their own tubewell. Among the respondent only 20,2 percent have their own sources for collecting drinking water and 79,8 percent of the households are collecting their drinking water from shared sources (see table 8). A shared public tubewell is situated on the common ground like, near the mosque/temple, school, market place or owner of a tubewell.

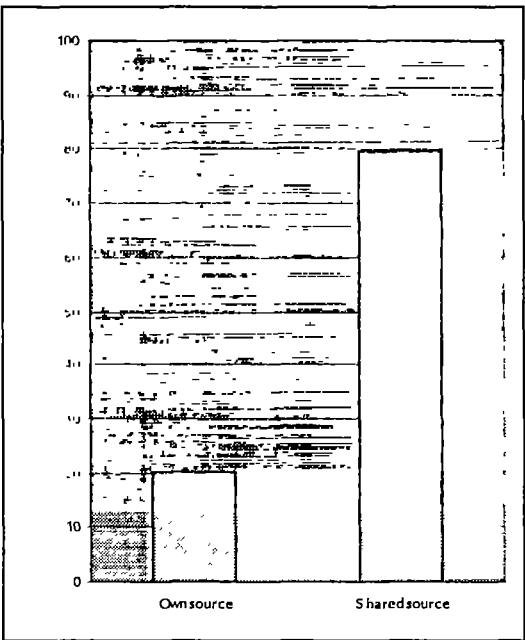
Table: 8 Households sources of drinking water

Area(District and Thana)	Own source		Common user		Total households
	No. of house hold	Area based %	No. of house	Area based %	
Pirojpur, Nesarabad	7	28	18	72	25
Potuakhali, kalapara	3	12	23	88	26
Borguna, Amtoli	6	19	25	81	31
Bhola, Doulatkhan	5	16	26	84	31
Barisal, Bakerganj	7	26	20	74	27
Jhalokathi, Nalsity	6	21	22	79	28
Total Barisal division	34	20.2	134	79.8	168

Source: - Author's field survey

Within the Barisal region the lowest percentage of shared users is found in Nesarabad (Pirojpur) and the highest percent is in are the Kalapara (Potuakhali) area. Nesarabad is near to Barisal Divisional centre and Kalapara is far way from the Barisal Divisional centre and the infrastructure condition is not good in this region. The question is why people collect their safe drinking water from shared sources. In this regard, it is difficult to provide for them a private tubewell and sometime tubewells are not functioning due to non-availability of spare parts. Those who posses a private tubewell, don't get the services properly or they have to pay more in a hidden way. A shared source of drinking water is usually located a far way from the home. The study findings will show later how far they have to go for their drinking water and who is the water collector .

Figure: 2 Sources of drinking water



**5.1.4 Water use for cooking and washing purpose.**

In the rural area household collect their water for cooking and washing purpose from different sources. For this purpose they collect their water from tubewells, canal/river and pond. In Kalapara (Potuakhali), households also use water from dug holes because of salt water in the shallow tubewell. This area is near to the Bay of Bengal. Using cooking and washing water depend upon their access to their nearest source or easiest way and choice also.

Table: 9A Area based cooking and washing water collection from different sources

Area (District and Thana)	Shallow tubewell	Deep tubewell	Dugwell	Canal / River	Pond
Pirojpur, Nesarabad	3	5	0	9	8
Potuakhali, kalapara	0	2	6	3	15
Borguna, Amtoli	2	7	0	6	16
Bhola, Doulatkhan	3	8	0	0	20
Barisal, Bakerganj	4	6	0	3	14
Jhalokathi, Nalsity	4	7	0	5	12
Total Barisal division	16	35	6	26	85

Source:- Author's field survey

In Barisal region only 9,5 percent household uses water for this purpose from the shallow tubewells, 20,8 percent household uses water from deep tubewells, 15,5 percent household uses water from canal/river and 50,6 percent of households use water from ponds. Only 15,1 percent of the households use tubewell water for their domestic cooking and washing purposes and highest water users (50,6 percent) are from the pond. Households also use ponds for their bathing, cloth and dish washing purposes. Some ponds are connected to the river or canal. During the rainy season ponds are vulnerable because they are easily contaminated with flood water or irrigation water. Referring to the Bradley's classification of water-related disease transmission routes; infections are easily spread under these circumstances.

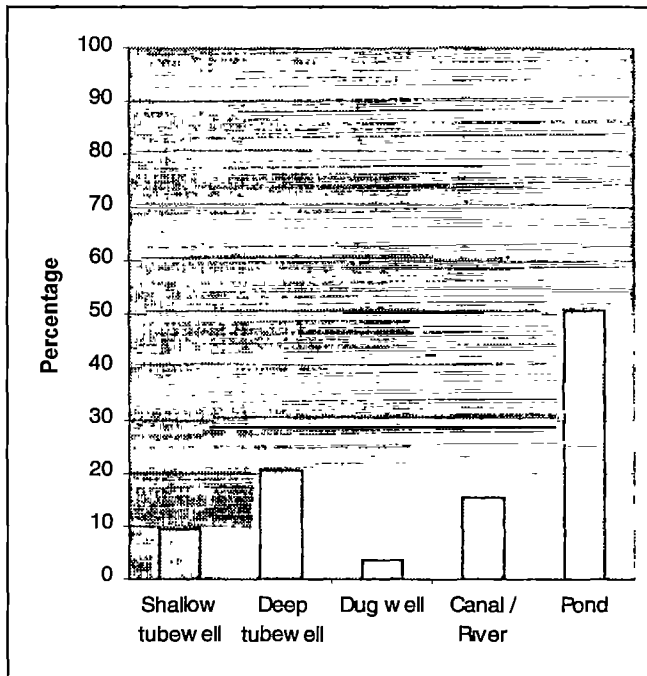
Table: 9B Percentage of Cooking and washing water collection from the various sources

Sources	No.of household	Percentage
Shallow tubewell	16	9,5
Deep tubewell	35	20,8
Dug well	6	3,6
Canal / River	26	15,5
Pond	85	50,6
Total	168	100

Source: Author's field survey



Figure: 3 Cooking and washing water collection from various sources



A pond for several purposes of water use

### 5.1.5 Distance from home to sources of drinking water

It is important to know about the distance from home to the sources of drinking water collection. Among the respondent in Barisal region only 20,2 percent household collects their drinking water from their own sources. 24,4 percent household get water from the source which is adjacent to their home (see table10B). It may be 10 metre to 50 metre. 22,6 percent household collects their drinking water within 100 metre, 19,1 percent household collect their drinking water within 100 metre to 200 metre and 13,7 percent household collects their drinking water which is more than 200 metre. 67,2 percent household collects their drinking water within 100 meter and rest of them collects their water more than 100 metre away.

However, during the dry season water collectors have to walk around one kilometre. Sometimes some tubewells are not functioning due to non-availability of spare parts or lack of proper services. In the rural area, women and children, who often are suffering from malnutrition, usually carry water. In Bakerganj one women was complaining that the family would die for lack of drinking water, because the tubewell is too far from their home. The distance was about half a mile. As a drinking water source the tubewell is far away from their home so they are using the pond. Often ponds are connected to canals. It was observed that hanging latrines often are attached to the canals. As water is usually carried on the hip and head, the impact of carrying a water load on women's health is substantial.

Table: 10A Distance from home for collecting of drinking water.

District and area	Own source	Near home	within 100m	100m-200m	more than 200m
Pirojpur, Nesarabad	7	8	8	1	1
Potuakhali, kalapara	3	3	5	9	6
Borguna, Amtoli	6	7	7	6	5
Bhola, Doulatkhan	5	9	6	7	4
Barisal, Bakerganj	7	6	5	5	4
Jhalokathi, Nalsity	6	8	7	4	3
Barisal Division	34	41	38	32	23

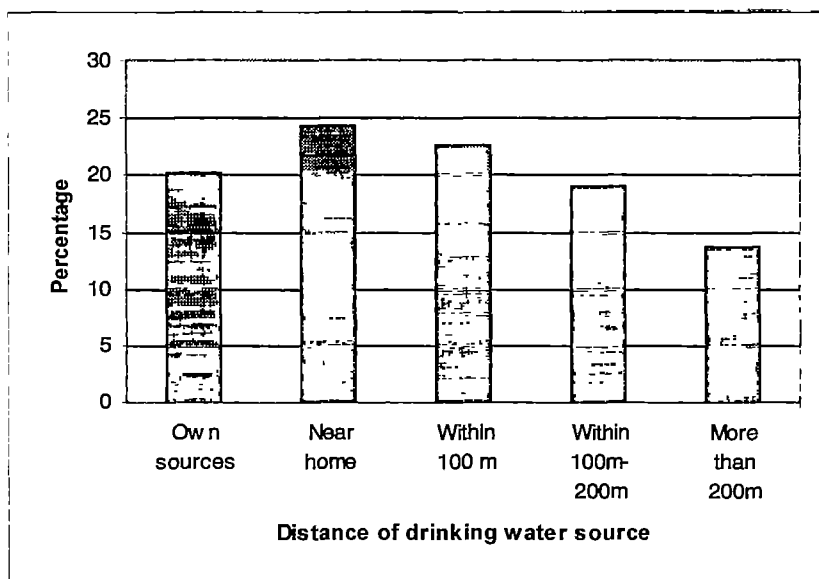
Source:- Author's field survey

Table:-10B Distance form the sources of drinking water by percentage

Distance of drinking water source	Number of household	Percentage
Own sources	34	20,2
Near home	41	24,4
Within 100 m	38	22,6
Within 100m-200m	32	19,1
More than 200m	23	13,7
Total	168	100

Source:- Author's field survey

Figure: 4 Distance form the sources of drinking water



The task of carrying heavy loads over long distances requires a great deal of energy, which comes from metabolised food. The longer the distance and the more difficult the terrain, the greater the quantity of food needed. Women carrying water are frequently exposed to malnutrition, anaemia and water-related diseases. Women are most vulnerable to malnutrition at the end of the dry season when they have to walk even greater distances to fetch water. Women and children suffering from malnutrition are also more susceptible to other diseases.

#### 5.1.6 Washing place for cloths and dishes

Households wash their cloths and dishes at the nearest place available to their house. It may be a pond, a tubewell, a canal etc. The survey shows that most of the households wash their cloths and dishes in the pond. In Barisal region, among the respondents 70,2 percent wash their cloths and dishes in the pond. 19,6 percent people wash their cloths

and dishes in the canal/river and only 6,6 percent household uses tubewell for their cloths and dishes washing purposes. When they wash their cloths and dishes in the ponds, the dirty water mix with the pond water, which they later use for other purposes. During the period of data collection the researcher observed that there is no drainage system dispose of the dirty water. Generally the dirty water is discharged to the down stream (no specific place) or it dries or surrounding areas get wet and some time it smells bad when they also throw waste water near to the homestead. It is also a source of mosquito breeding grounds. Mosquito is the bearer of the malaria parasite.

Table:-11 Washing place for cloths and dishes.

Area(District and Thana)	Pond	Area based %	Tube well	Area based %	Canal/ River	Area based %	Dug well	Area based %
Pirojpur, Nesarabad	11	44	1	4	13	52		
Potuakhali, kalapara	18	69,2			2	7,7	6	23,1
Borguna, Amtoli	19	61,3	2	6,5	10	32,2		
Bhola, Doulatkhan	28	90,3	3	9,7				
Barisal, Bakerganj	21	77,8	3	11,1	3	11,1	0	
Jhalokathi Nalsity	21	75	2	7,1	5	17,9	0	
Barisal Division	118	70,2	11	6,6	33	19,6	6	3,6

Source: Author's field survey

### 5.1.7 Bath and face washing place.

Washing the face in the morning and bathing are common practices in everyday life. People in general use water for bathing and face washing at the nearest place available to them. 'If the household use tubewell water for all purposes it takes time' is the households comment. During the period of data collection the researcher observed that ponds and canals are the common places for bathing and washing places. So many people use the same pond or same canal for bathing, washing, and cooking purposes. In almost every place in the study area the researcher found 40 to 80 people use one pond for several purposes. This multiple use is a main route of disease transmission.

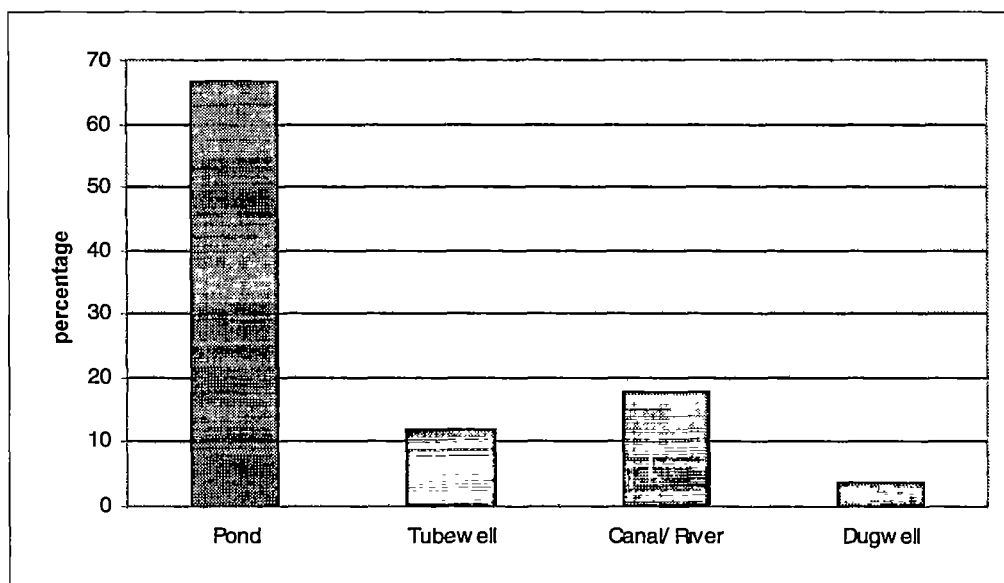
According to the survey result one could see the percentage of the users place for bathing and washing purpose (table 12). Among the respondents 66,7 percent households uses pond for bathing and washing purposes, 17,8 percent household uses canal/river and only 11,9 percent uses tubewell water for bathing and washing purpose.

Table: 12 Bath and face washing place.

Area(District and Thana)	Pond	Area based %	Tube well	Area based %	Canal/ River	Area based %	Dug well	Area based %
Pirojpur, Nesarabad	10	40,0	3	12	12	48		
Potuakhali, kalapara	15	57,7	3	11,5	2	7,7	6	23,1
Borguna, Amtoli	18	58.1	4	12,9	9	29		
Bhola, Doulatkhan	28	90,3	3	9,7				
Barisal, Bakerganj	18	66,7	5	18,5	4	14,8		
Jhalokathi Nalsity	23	82,1	2	7,2	3	10,7		
Barisal Division	112	66,7	20	11,9	30	17,8	6	3,6

Source:- Author's field survey

Figure: 5 Bath and face-washing place



## 5.2 Sanitation.

The access to sanitary facilities remains low in the rural area. Latrines are used mainly for reasons of privacy and convenience rather than health. Unhygienic conditions of many of the latrines in use in Bangladesh are general. A large section of the population is unaware that sanitary latrines, such as the home-made design, can be constructed at very low costs. In this section the researcher describes the findings of the sanitary conditions of the Barisal region such as users of latrine, the types of latrine by users, problems arising from the latrine and the cleaning performance by latrine users.

### 5.2.1 Users of latrine

Many people in the rural area don't use sanitary latrines. Some of the households do not have their own latrine. They use neighbour latrines. Even three to five or more families use the same latrine. In such a case many people can be affected because of unhygienic conditions. Low cost latrines can be used but the problem is the lack of health knowledge or proper information. The survey showed that 77,4 percent people have personal latrine and 22.6 percent people do not have any latrine in Barisal region (see table 13). In the rural area children usually don't use the latrine. They leave their excreta at open places and then mother or another person (caretaker of the children) clean the excreta or dump in a pit or in bush land. Among the personal latrines, a few of them are environmentally sanitary latrines and the rest of them are hanging or not environmentally sanitary latrines.

Table:13 Users of latrine by percentage.

Area(District and Thana)	Personal	Area based %	Common	Area based %
Pirojpur, Nesarabad	19	76	6	24
Potuakhali, kalapara	22	84.6	4	15.4
Borguna, Amtoli	26	83.9	5	16.1
Bhola, Doulatkhan	22	71	9	29
Barisal, Bakerganj	23	85.2	4	14.8
Jhalokathi Nalsity	18	64.3	10	35.7
Barisal Division	130	77.4	38	22.6

Source: Author's field survey

### 5.2.2 Types of latrine by users

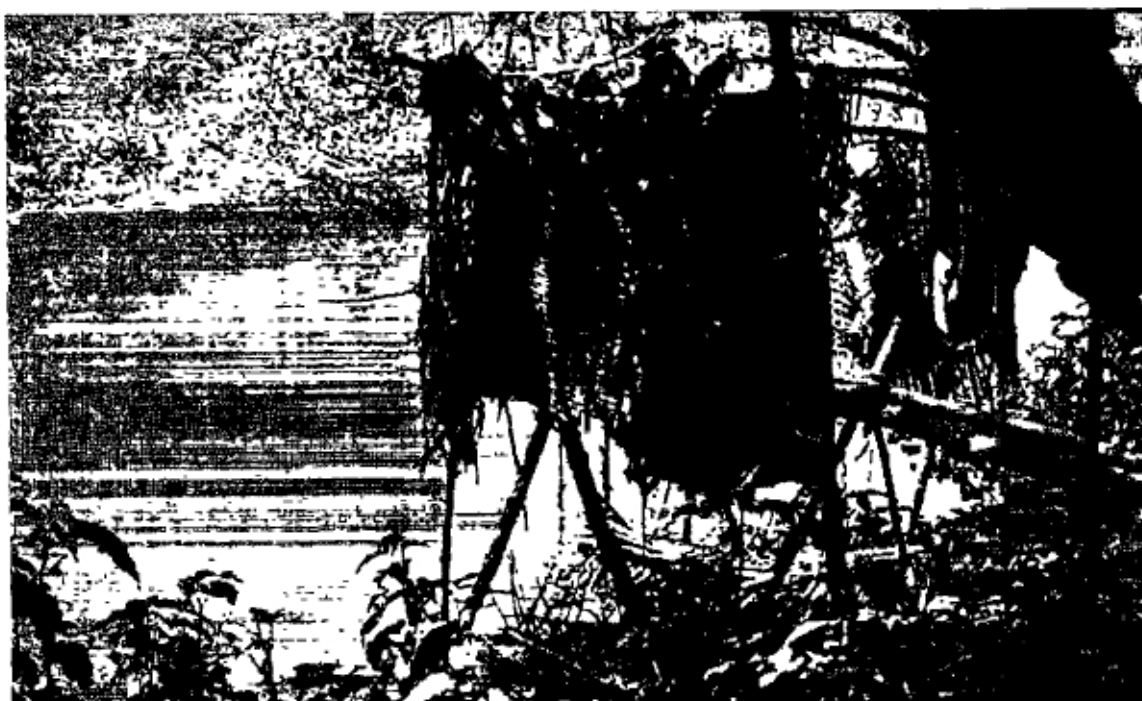
In Barisal region mainly two types of latrines can be found. One is Kacha which is hanging and not environmentally satisfactory. The other is pakka/ semi-pakka or environmentally sound. Latrine with septic tank is not available in the rural areas or it is too expensive for the poor household. The use of environmentally sanitary latrine structures depends upon their ability to be built. Few households clean it properly. On the other hand, Kacha or hanging latrine pollutes the environment in a different way. It is mainly open and also pollute the air. Sometimes it hangs over a canal or lake (unused pond, which is called 'doba') or near the pond. During the monsoon period it is easy to contaminate other water sources. It is also the breeding place of mosquitoes and flies. It affects not only the owner of the household but also the neighbours, who have environmentally sanitary latrines.

The survey results showed that 58,3 percent household use kacha or hanging latrines and 41,7 percent household use environmentally sanitary latrines. Among the respondents the worst condition of latrines is found in Doulatkhan (Bhola) area. Only 25,8 percent use sanitary latrines in this thana.

Table: 14 Type of latrines by the users.

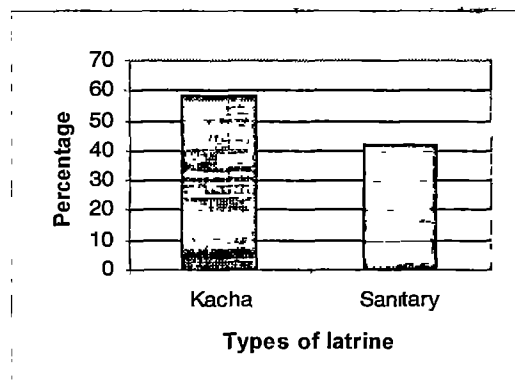
Area (District and Thana)	Kacha	Area based %	Semi-pakka/ environmentally sanitation	Area based %
Pirojpur, Nesarabad	10	40	15	60
Potuakhali, kalapara	16	61,5	10	38,5
Borguna, Amtoli	22	71,0	9	29
Bhola, Doulatkhan	23	74,2	8	25,8
Barisal, Bakerganj	15	55,6	12	44,4
Jhalokathi Nalsity	12	42,9	16	57,1
Barisal Division	98	58,3	70	41,7

Source: Author's field survey



A hanging latrine hanged over the common water source

Figure: 6 Type of latrines.



### 5.2.3 Disposal cleaning performance

To treat properly the pit contents is an important task for a healthy environment. Many users do not properly dispose off the pit contents when pits are filled up. Such latrines are either abandoned or the contents are dumped in an unsanitary way. During the survey some respondents did not answer straight. Some of them answered “yes we clean when it filled up” but most of them answered the pit was cleared irregularly. Those who use the open or hanging latrine, they don’t dispose off their latrine at all. During the rainy season downstream water or floodwater dispose off the excreta for them. 36,3 percent dispose off or close their pit contents irregularly and 4,8 percent yearly and only 0,6 percent dispose off of close their pit contents half yearly (See table 15).

Table: 15 Disposal cleaning performance

Area(District and Thana)	Half a year	Area based %	Yearly	Area based %	Not at all	Area based %	Irregularly	Area based %
Pirojpur, Nesarabad	1	04	3	12	10	40	11	44
Potuakhali, kalapara			1	3,8	16	61,5	9	34,6
Borguna, Amtoli			2	6,4	22	71	7	22,6
Bhola, Doulatkhan			0		23	74,2	8	25,8
Barisal, Bakerganj			1	3,7	15	55,6	11	40,7
Jhalokathi Nalsity			1	3,6	12	42,9	15	53,5
Barisal Division	1	0,6	8	4,8	98	58,3	61	36,3

Source: Author’s field survey



#### 5.2.4 Environmental awareness of latrine use

Latrines, especially open latrines create air pollution, risk of contamination in the monsoon season and they are the place of mosquito and flies breeding which is a main risk of health hazards. Environmental problems from latrines were not understandable by the household due to lack of awareness or that they don't care. In Nalsity (Jalokhathi), one of the household complained about the neighbours latrine because his neighbours latrine was open and it was adjacent to his pond, where the family takes bath and uses water for cooking and washing purposes. This is a cause of health hazard for them. The researcher also observed that many latrines were hanging over the canal. The people also use the canal for their bathing and washing purposes. Some of the household's conception is that the water is good because the water is moving. Moreover, so many latrines were found near ponds and the average distance was around five metres. 53 percent of the household (see table 16 A) felt problem arise from the latrine. Even if they feel the problems they don't use environmentally sanitary latrines. 25 percent household was aware of air pollution, 11,9 percent of water contamination and 16,1 percent answered both problems were a nuisance (see table 16 B).

Table: 16 A Awareness of environmental problems from the latrines.

Area(District and Thana)	Yes	Area Based %	No	Area Based %	No. of household
Pirojpur, Nesarabad	7	28	18	72	25
Potuakhali, kalapara	12	46.2	14	53.8	26
Borguna, Amtoli	22	71	9	29	31
Bhola, Doulatkhan	20	64.5	11	35.5	31
Barisal, Bakerganj	12	44.4	15	55.6	27
Jhalokathi Nalsity	16	57.1	12	42.9	28
Barisal Division	89	53	79	47	168

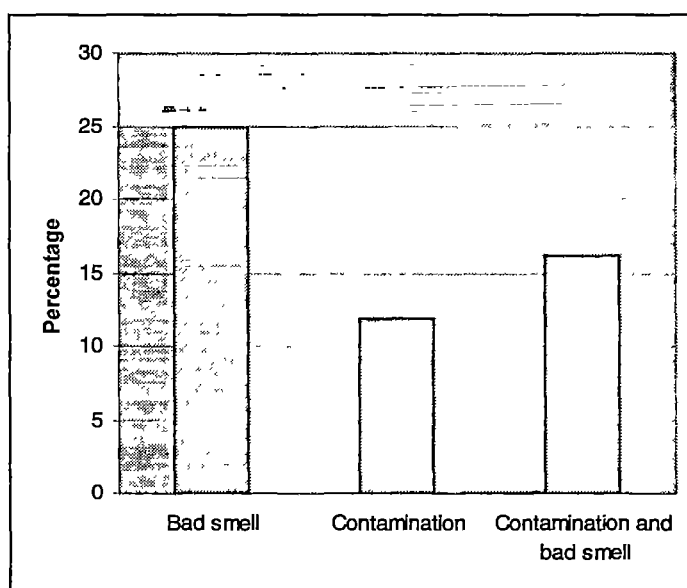
Data source: Author's field survey

Table: 16B Environmental problems from latrines

Area(District and Thana)	Bad smell	Area based %	Contamination	Area based %	Contamination and bad smell	Area based %
Pirojpur, Nesarabad	3	12	2	8	2	8
Potuakhali, kalapara	9	34,6	2	7,7	1	3,9
Borguna, Amtoli	14	45,1	6	19,4	2	6,5
Bhola, Doulatkhan	6	19,4	4	12,9	10	32,2
Barisal, Bakerganj	3	11,1	2	7,4	7	25,9
Jhalokathi, Nalsity	7	25	4	14,3	5	17,8
Barisal Division	42	25	20	11,9	27	16,1

Source: Author's field survey

Figure: 7 Environmental problems from latrines



### 5.2.5 Maintenance of the latrines

Maintenance of the latrines is an important task to maintain a healthy environment. Through lack of maintenance and awareness people are affected by various diseases. In the rural area people are not aware of the need to maintain latrines. They don't know about health hazard risks that arise from uncleanness of the latrine site. In Barisal

region the researcher found that only 36,3 percent household maintain their latrine site and 63,7 percent do not. The cleaning performance depends upon their consciousness or awareness. Some households clean it when they considered the site was dirty, some of the households clean the latrine site once or twice in a month.

Table: 17A Maintenance of Latrines.

Area(District and Thana)	Yes	Area based %	No	Area based %	No. of household
Pirojpur, Nesarabad	14	56	11	44	25
Potuakhali, kalapara	9	34,6	17	65,4	26
Borguna, Amtoli	9	29	22	71	31
Bhola, Doulatkhan	7	22,6	24	77,4	31
Barisal, Bakerganj	10	37	17	63	27
Jhalokathi, Nalsity	12	42,9	16	57,1	28
Barisal Division	61	36,3	107	63,7	168

Data source. Author's field survey

Table: 17B Interval of cleaning performance

Area(District and Thana)	Daily	Area based %	Week -ly	Area based %	Fortnig -htly	Area based %	Mont- hly	Area based %	Irreg- ularly	Area based %
Pirojpur, Nesarabad	2	8	4	16	2	8	1	4	5	20
Potuakhali, kalapara	1	3,8	3	11,5	2	7,7	1	3,8	2	7,7
Borguna, Amtoli	2	6,5	2	6,5	1	3,2	1	3,2	3	9,7
Bhola, Doulatkhan	1	3,2	2	6,5	1	3,2	1	3,2	2	6,5
Barisal, Bakerganj	2	7,4	2	7,4	1	3,7	2	7,4	3	11,1
Jhalokathi Nalsity	1	3,6	3	10,7	3	10,7	2	7,1	3	10,7
Barisal Division	9	5,4	16	9,5	10	5,9	8	4,8	18	10,7

Source: Author's field survey

Among the respondents only 5.4 percent of the households clean the latrine site regularly, 9.5 percent clean weekly, 5.9 percent clean fortnightly, 4.8 percent clean monthly and 10.7 percent clean irregularly (See table17B).

### **5.3 *Hygiene education and practices***

Without practicing personal hygiene, it will not be possible to provide water supply and sanitation for good health. Hygiene practice will be effective only if the households have a good knowledge of hygiene. In the rural area, people do not maintain hygiene due to unawareness of health care and some people don't know how they are affected by diseases. Some of them believe that they could not do anything because God gives them a disease and God will save them.

Primary health care differs according to the needs and conditions in the country and the personal awareness. First motivation and real commitment to the social betterment for the rural peoples is necessary. Primary health care that employs low-cost effective organisational structures and technologies, which include preventive, promotive, curative and rehabilitative health measures and community development activities, which are needed to, fulfil this goal.



Canal water in a market is used for food making, cleaning and waste disposal

#### **5.3.1 *Awareness of water related diseases***

Nationally hygiene knowledge has gained political importance during the last decade. But in fact many people, mainly in rural areas don't perceive this message properly. Households do not realize that if they drink water from a bad source they can easily be affected by diseases. They don't have proper knowledge about water borne diseases. However, in Barisal Division they answered positively. 85,1 percent household answered that they have realized the threat of water related diseases, and 14,9 percent have no idea about water related diseases.

Table: 18 Awareness of water borne diseases.

Area(District and Thana)	Yes	Area based %	No	Area based %	No. of household
Pirojpur, Nesarabad	21	84	4	16	25
Potuakhali, kalapara	23	88,5	3	11,5	26
Borguna, Amtoli	25	80,6	6	19,4	31
Bhola, Doulatkhan	28	90,3	3	9,7	31
Barisal, Bakerganj	22	81,5	5	18,5	27
Jhalokathi, Nalsity	24	85,7	4	14,3	28
Barisal Division	143	85,1	25	14,9	168

Source: Author's field survey

### 5.3.2 Access to hygiene information

People can get the knowledge of hygiene practices in a different ways. Radio, television Govt. and NGO health workers, schools, religious institutes or neighbours can provide it. Most of the rural people can't afford TV, radio etc. It is only affordable by some of the households and then these households can get the message, others when they watch TV or listen to radio at their neighbour. Children can learn or get the hygiene education from the school. The health worker's role is important. In Barisal region 75,6 percent people answered that they have got the information from a variety of sources. 24,4 percent had got no health information at all.

Table.19A Sources of hygienic information by number

Area(District and Thana)	Receive information	Area based %	No information	Area based %	N G O	TV	Radio	Different source	Govt.
Pirojpur, Nesarabad	20	80	5	20	7	3	17	8	8
Potuakhali, kalapara	18	69,2	8	30,8	13		16	3	3
Borguna, Amtoli	24	77,4	7	22,6	6		19	8	12
Bhola, Doulatkhan	23	74,2	8	25,8	11		23	7	9
Barisal, Bakerganj	20	74,1	7	25,9	8	2	16	2	7
Jhalokathi, Nalsity	22	78,6	6	21,4	8	1	15	3	5
Barisal Division	127	75,6	41	24,4	53	6	106	31	44

Source: Author's field survey

Among the respondents only 18,3 percent got the information from the Government worker, 22,1 percent from the NGO worker, 12,9 percent from various sources, only 2,5 percent from television and 44,2 percent from radio.

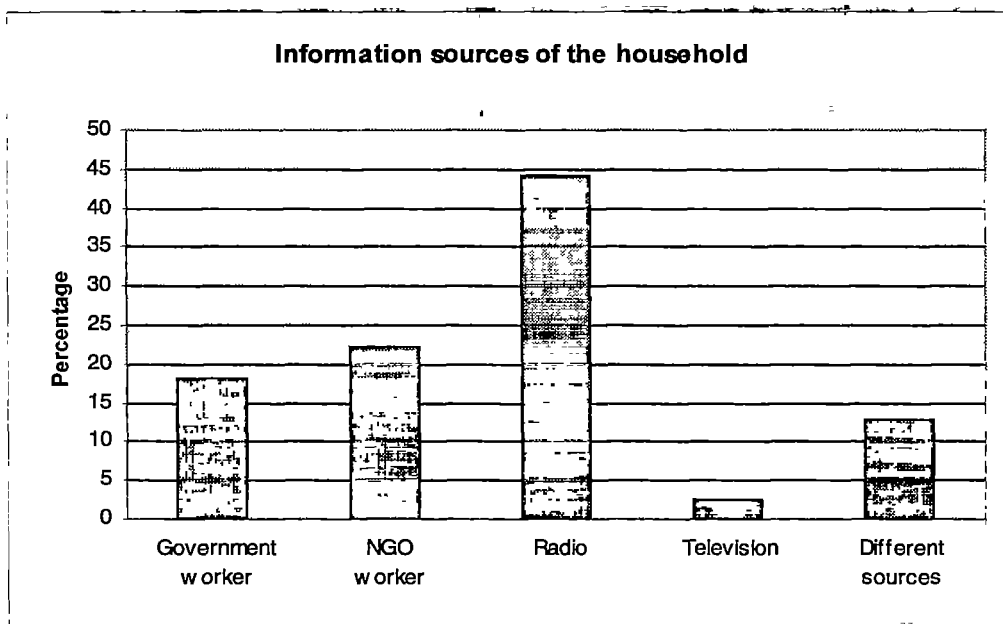
Table:19B Hygiene information sources by percent

Information sources	No. of household	Percentage
Government worker	44	18,3
NGO worker	53	22,1
Radio	106	44,2
Television	06	2,5
Different sources	31	12,9

Source: Author's field survey

N.B. Some respondents answered about multi information sources.

Figure: 8 Hygiene information sources



### 5.3.3 Washing hands after the use of the toilet

To protect from the diseases, the cleaning of the hands after using the toilet is important. It is important to know also how this is done. The researcher felt that this question was a bit sensitive. Respondents tried to avoid or hide the real answer. 40,5 percent household use soil and soap to keep clean their hands, 56,5 percent use soil or ash and only 3 percent use only normal water. Most of the households answered that they can not afford soap all the time. Otherwise they use soil, ash or water.

Table: 20 Cleaning hands after use of the toilet.

Area(District and Thana)	Soil & Soap	Area based %	Soil or ash	Area based %	Normal water	Area based %
Pirojpur, Nesarabad	14	56	9	36	2	8
Potuakhali, kalapara	10	38,5	16	61,5		
Borguna, Amtoli	10	32,3	21	67,7		
Bhola, Doulatkhan	12	38,7	19	61,3		
Barisal, Bakerganj	9	33,3	18	66,7		
Jhalokathi, Nalsity	13	46,4	12	42,9	3	10,7
Barisal Division	68	40,5	95	56,5	5	3

Source: Author's field survey



Using hand and water for cleaning the bottom after defaecation, is a traditional practice.

### 5.3.4 Washing hands before and after the meal

Like the previous question, this one is also sensitive. It was difficult to get a true answer from the respondent. People wash their hands after a meal and before a meal. In Bangladesh people don't use spoon, fork and knife. They use the hand for their meal, which is a tradition. In practice most of the people in the rural areas do not maintain their hygiene properly or do not know the effects of uncleanness.

The survey showed that only 12,5 percent of the people use soap for washing hands before a meal. 87,5 percent use only normal water (See table 21). People don't know the hygiene practice of washing hands after and before a meal. They lack the motivation.

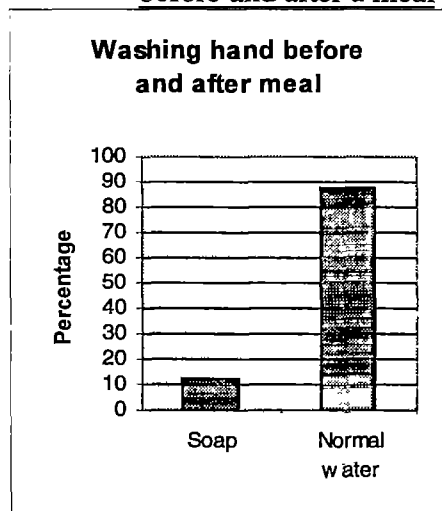
Table: 21 The practice of washing hands before and after a meal.

Area(District and Thana)	Soap	Area based %	Normal water	Area based %
Pirojpur, Nesarabad	6	24	19	76
Potuakhali, kalapara	2	7,7	24	92,3
Borguna, Amtoli	2	6,5	29	93,5
Bhola, Doulatkhan	4	12,9	27	87,1
Barisal, Bakerganj	4	14,8	23	85,2
Jhalokathi, Nalsity	3	10,7	25	89,3
Barisal Division	21	12,5	147	87,5

Source: Author's field survey

Note: They don't use soap all time

Figure: 9 Hand washing practice before and after a meal





### 5.3.5 Waste disposal practices

When the researcher was walking around in the study area, he did not find any drainage systems and disposal system of the waste. Everyone generates waste from food preparation and other housing activities like sweeping, although the quantity and type of waste may vary. In rural areas there are always hungry goats and cows to help with the disposal and dogs and birds aid in their efforts.

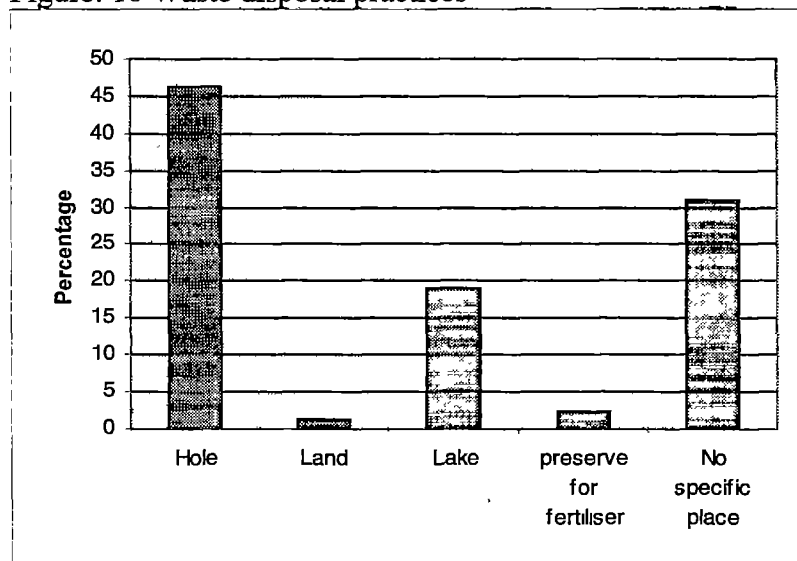
There is no local authority to collect the garbage. Households don't keep a healthy environment in this regard. It creates air pollution and the risk of contamination for households and neighbours. People usually dump their garbage and waste next to their homestead. When rain water pass over an open refuse dump and flows to surface water, there is inevitably pollution. Floating solids are unsightly, organic matter exerts an oxygen demand, and spread pathogens can create a health danger downstream.

Table: 22, Waste disposal practices

Area(District and Thana)	Hole	Area based %	Open Land	Area based %	Lake	Area based %	Preserve for fertiliser	Area based %	No specific place	Area based %
Pirojpur, Nesarabad	16	64			5	20			4	16
Potuakhali, kalapara	10	38,5			4	15,4			12	46,1
Borguna, Amtoli	11	35,5			6	19,4	2	6,4	12	38,7
Bhola, Doulatkhan	15	48,4	1	3,2	3	9,7	1	3,2	11	35,5
Barisal, Bakerganj	14	51,9			6	22,2	1	3,7	6	22,2
Jhalokathi, Nalsity	12	42,9	1	3,5	8	28,6			7	25
Barisal Division	78	46,4	2	1,2	32	19	4	2,4	52	31

Source: Author's field survey

Figure: 10 Waste disposal practices



If household did know a better system of waste disposal or the authority taught them, then they would be able to maintain their own waste disposal system. As it is now household dumps their waste at the nearest depression or hole, lake (doba) or open land. Sometimes, but rarely, they preserve it as fertiliser. In this survey 46,4 percent dump their waste in a hole, 1,2 percent on open land, 19 percent in lakes (doba), 2,4 percent preserve it for fertiliser and 31 percent have no specific places for disposal (see table 22).

#### ***5.4 Governments and NGO's activities in relation to Water Supply, Sanitation and Hygiene education.***

During the period of visit and discussion with the Government and NGO officials, the researcher has collected some information and activities about water supply and sanitation. Some contradiction was observed about their activities. Government's functional responsibility is delegated to the Department of Public Health Engineering (DPHE) in all rural and urban areas except Dhaka and Chittagong city. The Local Government Engineering Department (LGED) is responsible for all infrastructures excluding WSS services. It shares responsibilities in some cities and all pourashavas (local town development authority) with the DPHE.

DPHE is responsible for planning, designing, and implementing water supply and sanitation services in rural areas, thana towns and pourashavas. DPHE has supervisory staff at districts and thana levels and is represented at union parishad level by tubewell mechanics and masons. One executive engineer is assigned to each of the district officers. With a mission to provide universal access to water and sanitation facilities for the people, DPHE was developed with a strong technical bias emphasising WSS infrastructure development. Experience of the IDWSS decade has shown the need to expand the scope of water supply and sanitation beyond provision of 'hardware' to include more emphasis on health education and the use of facilities. Factors of emerging importance include community participation, involvement of women, social mobilization and hygiene education, all of that require skills and institutional inputs, which differ from those in an organisation primarily devoted to engineering. DPHE has acknowledged a need to adapt to the situation.

The researcher visited public health offices in Nesarabad and Amtoli and talked to the responsible persons of these offices. According to their opinion they have only four mechanics for each thana who visit households when people complain. The health office also arranges training programmes about 'software' for the local people and DPHE staff. On the other hand households also complained that there were no trained person to repair their tubewell. One tubewell was not functioning since eight months and they informed to the DPHE staff but they did not get any response to repair the tubewell.

Non-Governmental Organisations are active in water and sanitation programmes financing and implementation in both rural and urban areas. Bangladesh is endowed with many NGOs, and almost every thanas have active organisations working in a variety of development areas. There are numerous training NGOs devoted to supporting thousands of smaller NGOs at local levels. BRAC, Proshika, Grameen Bank, are working in this field. UNICEF (United Nation International Children's Emergency

Fund) and DANIDA (Danish International Development Assistance) is supporting Government and other NGO's. The Grameen Bank provides loans for housing programme that include latrines, but the construction of latrines *per se* is not a mandatory activity of any NGOs. Proshika and Grameen Bank suggest the loaners (members) to buy sanitary latrines in instalments when they borrow money for housing purposes. They sell the latrines at an actual cost, which is about US\$ 15.00.

The NGO Forum, an apex service body associated with ADAB (Association of Development Agencies in Bangladesh) is the premier NGO in the water supply and sanitation sector, assisting 'partner' NGOs by providing hardware support, an advocacy, networking, institution building, training, information, research, evaluation, and monitoring. The NGO Forum shares with the government a strategy of an □integrated approach,□ combining water, sanitation, and hygiene education. NGOs endeavour to integrate community participation with hygiene education, water supply and sanitation. Their mode of operation is to focus on village-level activities. NGOs may be more effective than government agencies in identifying the poorest households and delivering services to them.

Despite the more extensive and direct contact of NGOs with the rural population, the survey concludes that NGOs have yet to develop as a significant channel for delivery of sanitary latrines and their services have not yet reached to all the rural place. However, NGO activities more selectively target the poorest who may not be adequately served by other channels or have access to credits.

#### **5.4.1 Performance of organisation**

Performance of an organisation depends upon their activities with the related issue. Organisation here means Government and NGOs. Related issues are conditions related with the water supply sanitation and hygiene practice of the local people. Performance will be measured by their activities, communication and the positive impact on household's primary health care at the local level.

Operation and Maintenance (O&M) is crucial to the successful management and sustainability of water supply and sanitation systems, whatever the level of technology, infrastructure and existing institutional framework. The benefits of effective O&M are clear: improved health and well-being, and social, economic and financial advantages. But in reality it was not found that the proper operation and maintenance system was followed by the WSS authority. The following findings will show the organizational performance of operation and maintenance, how often they visit the project area or how they communicate with the rural area to keep updated on the household problem in terms of water supply and sanitation hygiene practice.

#### **5.4.2 Frequency of visit**

Communication can take place either by personal contacts through extension workers, by media such as leaflets, posters, and other visual aids, or by a combination of these means to improve the condition of water supply, sanitation and hygiene education. Communication is important not only to achieve the full use of new water and sanitation facilities but also to ensure their maintenance and even their proper construction. A latrine is part of a family's living space, and relates to some of their

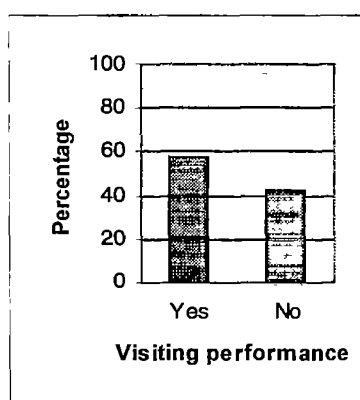
intimate habits. People will not use a latrine, and certainly will not be willing to build one or contribute to its cost, unless they have been convinced of its advantages. It also depends on the performance of the health worker or NGO worker at the local level. Households are not well informed or unaware of safe water supply, sanitation and hygiene practice. It is needed to develop visual aids both to teach people and to promote the programme at the planning, mobilisation, implementation and maintenance phases.

Table:23A Frequency of households, which have been visited by WSS worker.

Area(District and Thana)	Yes	Area based %	No	Area based %
Pirojpur, Nesarabad	15	60	10	40
Potuakhali, kalapara	16	61,5	10	38,5
Borguna, Amtoli	18	58,1	13	41,9
Bhola, Doulatkhan	20	64,5	11	35,5
Barisal, Bakerganj	15	55,6	12	44,4
Jhalokathi, Nalsity	13	46,4	15	53,6
Barisal Division	97	57,7	71	42,3

Source: Author's field survey

Figure: 11 Frequency of households, which have been visited by WSS worker



About 57.7 percent answered positively about the visit by Government and NGO workers (see figure 11). People also complained that they are not getting the services properly. Among the government workers, here we found mainly health and family planning workers are not enough trained on water supply and sanitation matters. One of the households complained that his tubewell was not functioning since five months. The family informed the local public health department, but its negligence to assist hurted the household. In that community there is no skilled person to repair tubewells. In

general the public health office is situated in the thana centre, which usually is quite far from the villages. Some time public health offices have lack of staff. Even the public health staff also complained that only four persons for a thana is not enough. Some time they visit once a year, some time they visit twice a year. Few workers visit monthly and only 9,5 percent household talked about monthly visits. 8,9 percent household talked about quarterly visits, 5,4 percent talked about yearly visits and 24,4 percent talked about the irregularly visits by health worker. 42,3 percent household answered negatively about the visit of the health worker. Probably they were angry at the service provided or they misunderstood the interviewer's questionnaire.

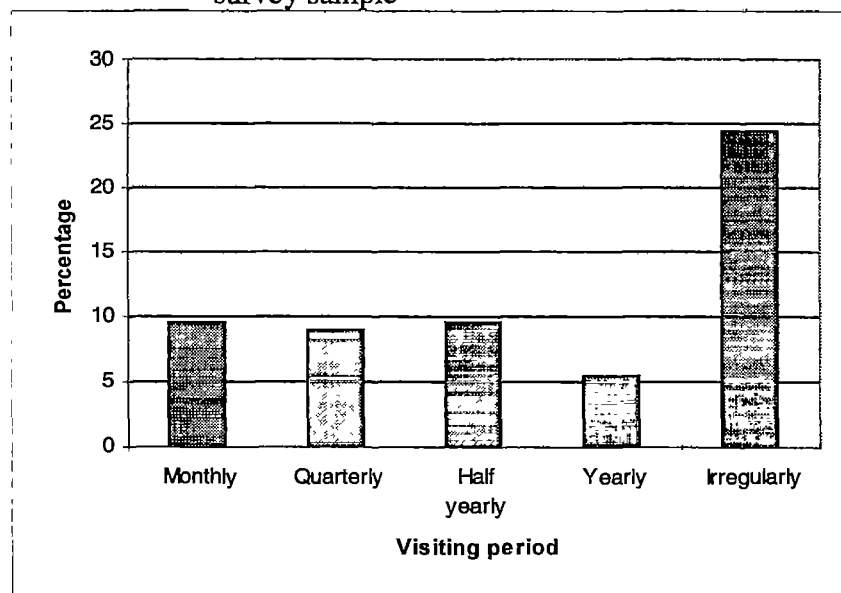
To introduce a new water supply or latrine or to improve domestic hygiene requires a change of people's behaviour to some extent. They may need little persuasion to do so, but there can be little doubt that they are most likely to make the change in a satisfactory way if there is good communication between them and those who implement water and sanitation programmes.

Table:23B Visiting frequency among the positive respondent in the survey sample.

Visiting period	No.of household	Percentage
Monthly	16	9,5
Quarterly	15	8,9
Half yearly	16	9,5
Yearly	9	5,4
Irregularly	41	24,4
Total	97	57,7

Source: Author's field survey

Figure: 12 Visiting frequency among the positive respondent in the survey sample





# Chapter VI

## 6. Discussion and conclusion

The survey indicates that there exists serious problem in water supply, sanitation and hygiene education in the investigated area. It is important to know how the present situation can be improved.

### 6.1 Existing problems in Water supply, Sanitation and Hygiene education

#### Water supply and uses

The study has exposed that the use of tubewell water for drinking water purpose achieved almost universal coverage in Barisal region. But use of tubewell water for other purposes such as cleaning, cooking, and bathing was low. Households use water from other sources such as ponds, canal waters because it is easier to get or take less time to carry home or it is near their homes. When they use ponds or canals for other purposes, it is sources of communicable diseases. There are seldom trained persons for repairing tubewells. Families also complain that they have to pay money to the public health department staff for repairing service.

The way to store water for cooking and drinking water is not hygienic. Households don't clean the water containers well inside and outside, and the water container is kept uncovered, which is an additional risk of contamination and transmission.

Most of the rural people collect their drinking water from a shared source. One tubewell is used by two to twenty or more families. They use shared tubewells because of shortage of tubewells. Rural households usually can't afford their own tubewell, even though the price to construct a tubewell is low in Bangladesh. Sometimes a tubewell is not functioning because spare parts are not available and there is a lack of trained repair people. The task of carrying water is usually carried out by women and children. This is a heavy work as women and children are suffering from malnutrition in the rural area. They have generally to walk a long distance to the shared source to collect drinking water. Sometimes the private owner of a tubewell misbehaves with them and sometimes they have to queue up.

The people in the remote areas spatially suffer more than more centrally located service centres. Nesarabad, which is near to Barisal divisional centre, has the lowest shared use of a tubewell. The households of a remote area like Kalapara have the highest shared use of a tubewell. Probably this remote area is neglected by the WSS service authority. In Bangladesh, the people in the rural areas have been often neglected by the responsible authority. People complain of the lack of basic services. In this context Chambers (1983) described that the rural poverty unobserved because of six biases which is spatial bias, project biases, person biases, dry season biases, diplomatic biases and professional biases (see page 10-11).

The main water supply problems in the survey area could be summarized as;

- Not sufficient number of tubewells for drinking water purpose.
- The way to store water is not hygienic
- Lack of trained people for repairing of the tubewells.
- Unsatisfactory service for repairing the tubewells.
- Road and transportation problems in carrying components of water supply and sanitation technologies.
- Poor economic status/limited affordability of the majority of people to buy/install the provision.

### **Sanitation**

Sanitation in the rural area is not satisfactory. Latrines are used mainly for the reason of privacy rather than health. Many people are not using the sanitary latrines. Some of the households have not a latrine at all. They may use a latrine at their neighbours, such as two or more households (they are mainly patrilineal kin group) use the same latrine, we can say the shared use of a latrine.

Around 60 percent people use kacha latrine, which is not environmentally sanitary. Most of them are hanging and open, situated near a pond or canal. Some of them hang beside the canal and the excreta go direct to the water sources. These open and hanging latrines create air and water pollution, which is health hazardous for the households directly or indirectly. It is also the breeding place of mosquito's and fly's.

Unhygienic use of latrines in the rural areas of Barisal region is a common matter. This situation is not understood by the households because they have lack of awareness or they don't care. Even if they feel the problem still a lot of households don't use the environmentally sanitary latrine. Low cost latrines may be used if it is available for them. We found in a leaflet when we visited the NGO office, a burnt clay ring (for latrine) which cost only TK.10-15 and which can be made locally. It can provide an additional earning source to some families. In reality, households lack necessary information.

Rural people are not aware of the disease transmission routes. Such a route is the latrine, when it is dirty or not cleaned properly. It was found that a very low rate of the households cleans their latrines regularly. When the latrine is shared by many households, it is possible to spread out the disease to many people from one latrine. In this respect people has lack of awareness. People have lack of awareness, as the information from the WSS authority is poor. In this region sanitary inspection is a crucial part of any surveillance program and need to be carried out by trained people at the community or regional level. However trained people is not sufficient.

The main sanitation problems found in the survey areas could be summarized as;



- Poor sanitary standard.
- Lack of information and services in relation to sanitary technology.
- Lack of knowledge about sanitary problem and transmission routes.
- Unsatisfactory cleaning performance

### **Hygiene education**

Hygiene practice will only be effective if households have good hygiene knowledge. Households in the rural area don't maintain hygiene because they are not aware of the problem and they don't get the necessary information. Although in the survey, they answered positively that they know that their drinking water from different sources like ponds, canals etc. can be contaminated, they don't realize how they can be hit by water borne and water related diseases. They don't have the necessary hygiene education. Around 63 percent of the respondents in the households can write their names.

Communication is important to get a better result in hygiene practice. Media is important in this regard. In the rural areas radio is an accessible media to diffuse the message of hygiene education. But all households do not have the access to a radio. In that case school and health worker's role is important to motivate people about their hygiene practice. It was found that the household received information by Government health workers to a minor degree. Advises from NGO worker's is more frequent than from Governments workers.

The hand washing practice is a serious cause of disease transmission and a great risk of contamination. After using the toilet and before a meal, proper hand wash can prevent the spread of diseases. The question of hand wash was sensitive. People can't afford soap all the time. If they afford soap then they use it; otherwise they use soil, ash or normal water.

It was found that there was no system or authority for waste disposal management. Households have no idea about this. It is the cause of disease outbreaks if they are not aware of it. Dumps of waste can easily be soaked by floods or rain water and quickly reach the households water sources. Waste dumps next to the homestead also produce air pollution. Dumps are also the breeding place of fly's and mosquitos.

The main hygiene education problems in the survey area could be summarized as;

- Lack of education and awareness in general and in relation to use and maintenance of WSS.
- Lack of communication between the WSS authority and households.
- Lack of proper services.
- Inadequate visiting performance of organisations.
- Lack of integration between the WSS authorities and the health workers.

## ***6.2 Women in Water supply, Sanitation and Hygiene education***

In Bangladesh women as water carriers, end-users and guardian of household hygiene play a principal role in water and sanitation management. Women of rural Bangladesh spend eight or more hours a day using mostly unhealthy water. Women are unaware that millions of children die every year because faeces are not disposed off in a sanitary way. Women prefer the tubewell to be located near to their home. Due to long distance from the houses it is difficult to use and carry tubewell water for other purposes than drinking. Lack of knowledge about water and sanitation activities creates health hazards for the whole family. If they know how to repair a tubewell and how to make cleanliness themselves it would be easier to operate and maintain. Observations during the survey indicate that there was no involvement of women in the community training and management. They don't have the proper knowledge and education in relation to water supply and sanitation. Probably the roles of women are not a top priority in the planning process. The mobilization of women in relation to water supply and sanitation can be summarized as;

- Lack of education and knowledge among women,
- Lack of recognition of women's role and contribution in WSS.
- Lack of recognition of the importance and value of women's work in WSS
- Weakness in organisational, economical and training policies in motivating and employing women.
- Women lack earning power and this gives them less autonomy for decision making.

## ***6.3 Existing problems in project management.***

There are other major problems in water supply, sanitation and hygiene education, which affects implementation of projects. To achieve the full benefit from the water and sanitation project, weakness and shortcomings must be identified. Otherwise the project will not be successful. The following issues are discussed below;

- Lack of appropriate services,
- Weakness in operation and maintenance
- Lack of community training.
- Bad communication system in the rural area.

### **Lack of Appropriate Services**

Hygiene education and the promotion of better hygienic practices at grass root level are now a days considered as fundamental parts of any water supply and sanitation programme. They enhance the likelihood of effective community management and ensure that facilities are properly constructed, used and maintained. In fact, the service provided by the organisations was not satisfactory. It is the lack of the responsible

authority, which has great role to serve the local people in a region, to find out its lackings in relation to water supply, sanitation and hygiene practices. It is also necessary to inform them about low cost technology and where and how they can get access to this opportunity. Clarification of the role of the different actors is necessary. The transfer of the role of governments from provider to enabler and regulator is crucial, but has to be coupled with the strengthening of the role of communities, NGOs and the private sector. Clarification is also necessary to identify the main local lacking in the services in order to introduce a new sanitary system. In Bangladesh 70 percent of the population are basically illiterate, the main attractions of latrines are privacy, convenience, and comfort of women and prestige. To change this mismatch of perceptions between authorities and the community, a process of social mobilization was launched in 1990. The new integrated approach adopted in Bangladesh was scheduled to cover the whole country by 1995. In 1997, during the fieldwork in Barisal area, it seemed that it would be quite difficult to cover the whole country unless the WSS services are strengthened by partnership programmes including all actors. Households are not generally satisfied with the performance of the organisations. Their inspection visits for water supply, sanitation and hygiene knowledge purpose were not satisfactory.

### **Weakness in Operation and Maintenance**

Operation and maintenance is not limited to the sole activity of a caretaker or a technician; it also includes the activities of various actors at different levels. It should forward planning and technology transfer at all stages of the project cycle, from installation of plant and equipment, through operator training and hand over, to routine operation and upkeep, including purchasing of spare parts, repair procedures and financial management, as well as best practice in operating and maintaining the system. A large number of people use the hanging latrine, which seriously affects other households. For instance; there exists no regulation that prohibit the household to dump the excreta next to the canal or beside the pond. Such a regulation would be an effective too.

Proper O&M are subject to many constraints like;

- The low profile of O&M, and the lack of priority it is given by policy makers;
- Lack of clear policies, appropriate legal frameworks and a well-defined division of responsibilities to support O&M.
- Poor management and responsibilities within projects and agencies;
- Inadequate access to data and field experiences about O&M, for use in planning O&M strategies;
- Inappropriate management at community level.

As part of remedying these constrains, a monitoring procedure is necessary to be carried out to survey changes in community, family, school children and hygiene practices. This should be carried out annually by the same community sanitary promoter.

### **Lack of Community training**

During the survey period household often complained about the inexistence of trained personnel. The researcher also found that some tubewells had not been functioning from four to eight months. If there existed trained personnel in the community, they don't need to seek help from a public health office or responsible authority and they don't have to wait for a long time for repairing tubewells. But still they need to seek assistance from a public health office or responsible authority. Community training is not only about repairing tubewells, the training contents needed basically cover all of the following items: water and environmental sanitation in health, child, family and community development; personal hygiene; care, disinfecting, boiling and conservation of water; adequate use and maintenance of latrines; garbage and waste water control and elimination; food hygiene, home cleanliness and environmental preservation. Community training programmes including the above mentioned issues were not found. Such an integrated training approach is needed for the well being of the rural people and to success of water supply, sanitation and hygiene education project. Due to lack of training, people are not be able to maintain the benefits of WSS projects.

### **Bad communication system.**

It is important to have a good communication network, which facilitates for rural people to visit the thana centre. Almost every rural area have lack of a developed road communication network. People in the rural area are badly suffering, especially in the rainy season.

### ***6.4 Willingness to pay and use versus willingness to serve***

It has never been a tradition in the country that the rural people pay for drinking water. Some characteristics influence a household's willingness to pay for an improved water supply: the socio-economic characteristics of the household such as education of family members, occupation, size and measures of income, expenditures and assets. During the survey one household asked the researcher to install him a tubewell because there was no tubewell near his house. He thought that the researcher was coming from the WSS authority and could help him. He wanted to pay the researcher for a tubewell installation. He did not know where and how he could contact the authority. Another household informed the researcher that he had given money to the public health office and now had waited more than two years, but he did not get the tubewell and at last gave up the hope of a tubewell. Most of the respondents believed that the government should provide more free tubewells. Rural households can pay little or nothing for improved water services. As the levels of education increase among household member, those households would be more aware of the health benefits of improved water supplies if the services are available. The World Bank Water Demand Research Team (1993) conducted studies into the determinants and policy implications. Their study indicated that effective policies and planning for water facilities must take into account what the rural households want and are willing to pay, if sustainability of the facility is a long term goal. In this regard, they have provided insights into how to decide what

level of service is appropriate for a particular community and how the improved services should be paid for. The team classified four broad categories of village situations, with appropriate policies ranging from the provision of house connections at full cost at one extreme, to no improvement in traditional supplies at the other extreme. These classified types of villages are as follows:

Type I : High willingness to pay for private connections;  
low willingness to pay for public taps

Type II : A few will pay the full cost of private connections;  
the majority will pay the full cost of public taps

Type III : Households are willing to pay for improved service,  
but improvement is very costly

Type IV : Low willingness to pay for improved water service

The World Bank research team stated in formulating the above water supply policies that it is important to create institutional arrangements which make people willing to pay for an improved WSS. However, the survey area can not reach this goal, as almost all households belong to the type IV category. People are too destitute to pay for water and sanitation service.

### **6.5 Recommendation and Conclusion**

The survey indicates that the majority of the households in Barisal region have access to safe drinking water; but household use of water for other purposes from different sources to which they have access, are unsafe, exposing the household members to various types of health hazards (see Bradley classification of water related disease transmission routes in the literature review).

Many factors interfere with the improvement of water supply and the provision of sanitation services in Bangladesh, including lack of trained personnel, shortage of capital, appropriate services, involvement of women, and inadequate political or community infrastructure.

External visiting teams for rural water supply, sanitation and hygiene practice should co-operate closely with the Ministry of Health and NGO's. One important issue is the protection of water sources from direct faecal contamination and from secondary pollution caused by leaching from pit latrines. Because water from rural community installations almost never is chlorinated, source protection is the first and most important means of providing hygienic drinking water. WHO's strategy for drinking water quality is to implement the protection of water supplies from bacteriological contamination in rural areas where standards have little meaning to promote. This requires regionally or locally based systems linked to primary health care for raising public awareness of the problem and possible solutions, including the implementation of minimal water quality surveillance and remedial measures relying on appropriate technology and community participation.

A latrine is part of a family's private living space, and relates to some of their intimate habits. People will not use a latrine, and certainly will not be willing to build one or contribute to its cost, unless they have been convinced of its advantages. Hygiene and health education must be included in primary school syllabus. Teachers are encouraged to produce their own teaching aids, in a way that they feel it, will be easily understood by their pupils.

To involve women fully should be high on the priority list for planners. With education and the provision of a clean water supply, women will learn that the suffering, disease and death caused by dirty water can be avoided and family health and hygiene improved by using pure water. At the national level, recognition of the role of women is demonstrated by women's increasing involvement at the grassroots level in water projects and programmes. National development plans, however, should place greater emphasis on strengthening the managerial capabilities of women to improve the efficient and sustainable use of water at local and national levels. It is essential that basic knowledge about water resources assessment is included in all programmes involving the capacity building of women. It is only through broader understanding of water resources and its implications for the livelihood of humankind that women will be able to contribute effectively to sustainable development as called for in Agenda 21.

All community training should be based on participatory methodology characterized by reflection-action-reflection in which the concepts learned are applied in practice. The following social actors at the community level should be encouraged to take part in WSS training.

- Sanitary promoters elected by the communities
- Popular reporters who with technical support produce and diffuse messages through radio stations.
- Primary school teachers who provide theoretical knowledge on hygiene education and supervise the practical application of this knowledge to children.

To obtain results, water and sanitation facilities must function well and be used consistently. Provided services must be sustainable, with timely maintenance and financial resources for repair and replacement when needed. They should also be replicable at sufficiently low cost. For this, a high level of commitment and collaboration is needed among all parties, including the users, the service providers and political leaders. Communication in turn requires behaviour and sharing, so as to be able to collectively plan, manage, control, assess, mobilize and sustain the necessary action required;

- Commitment within administrations, service providers and institutions to encourage community/user participation in decision making , planning, implementation and management of projects

- Capacity building at all levels using relevant participatory methods to stimulate interpersonal and two-way communication that respond to community cultures, behaviours and requirements.

The focus on behaviour, social processes and commitments seek to ensure that the application of technology will actually improve the quality of human lives. This requires the development of specific strategies, carefully adapted to local circumstances, which concentrate the action of all partners on the agreed goal.

Mobilization for participation is required with fair negotiation of the terms for operating facilities is the basis for efficient management, whether it is done by a utility company or community-based. A comprehensive schedule for the implementation of WSS is needed to be set up (See figure13). Gender-balanced approaches are also a must. Agency and community partnership approach can contribute significantly to the sustainability of water supply and sanitation programmes.

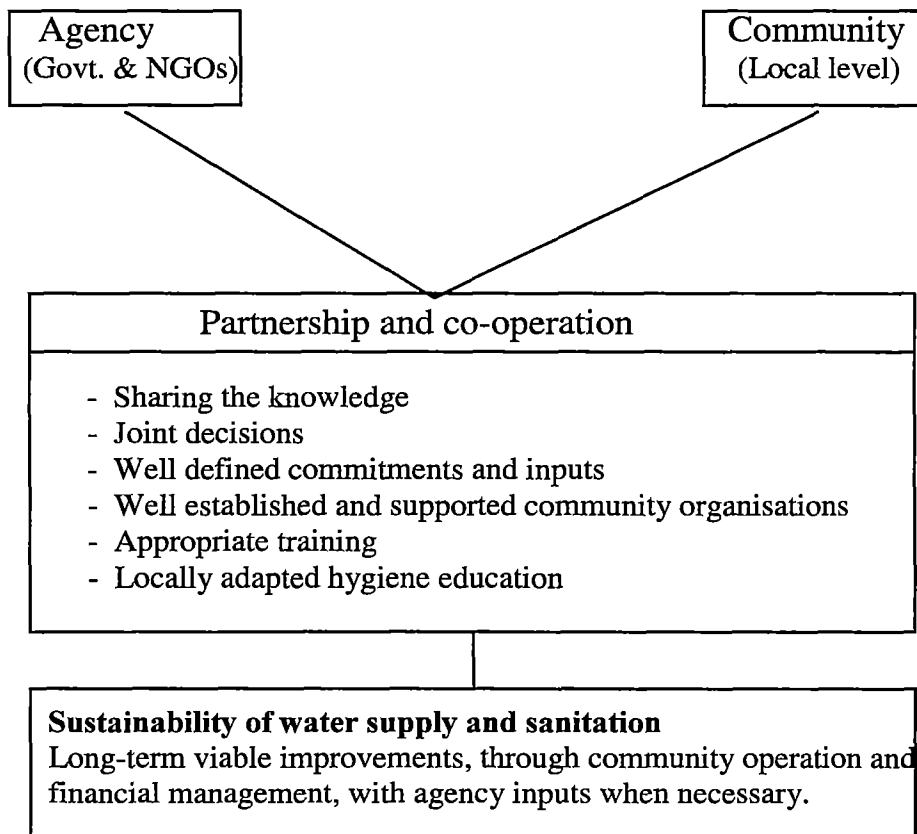


Figure: 13 A comprehensive model of WSS implementation

Sustainability is a widely used term, which has a variety of meanings depending on the context in which it is used, but it should be in the case of WSS scheme long term viable improvements, through community operation and financial management.

Based on a partnership approach the community has to decide on a system of caretaking once the water scheme has been completed, to ensure that problems are quickly

identified and remedied. Monthly meetings of community members can discuss issues related to water and sanitation schemes like habits of regular monitoring, dispute solving etc. Before initiating any work on a water scheme the community has to guarantee that it will take the responsibility of maintaining the scheme. Money for maintenance is collected on a monthly basis, and is saved in an account in the name of community. Some initiatives should be taken to provide the group members with income generation opportunities like constructing workshops to sanitary latrines and repairing firms to install tubewells etc. Other households should be given the opportunity to buy a tubewell in instalment if it is too expensive to buy at one time. To achieve the long term success partners should strengthen the service provision regularly on door to door basis in order to develop the overall infrastructure.



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## APPENDIX

### Questionnaire for field work

#### Background data of the households

1. Name: -
2. Location/address: -
3. Age: -
4. Sex: -
5. Education: - Illiterate/literate (Primary /High school/College/Higher education)
6. Family members (head and others): -  
Name ----- relation -----age -----education---others

#### Total

7. Residence: - Original settler/ migrant
8. Occupation: - Farmer / Labour / Business / Employee / Uncertain work / Unemployment
9. Monthly income: -  
> 1000 / 1001- 2000 / 2001- 3000 / 3001- 4000 / 4001-5000 / 5001>.
10. House information: -  
House structure / Floor area / Kitchen / type of toilet/ number of toilet
  - a) Kacha house
  - b) Tin shade
  - c) Building
11. Bathroom information: -  
Open: Pond / cannel / lake / tube well / others /  
Closed: (attached with the house)

#### Infrastructure facilities

12. Do you have electricity? Yes/no  
If no what kinds of energy do you use? Gas/oil / wood/ straw/ cow dung/ other
13. What kind of transportation you have or you use? Road communication /Water ways or both
14. How do you dispose of your waste? Pond/ hole/river/cannel /lake/open land/ preserve for fertilizer/no specific place.
15. What kind of educational institution is available in your village?  
Primary/secondary/Higher secondary/ Religious education/ others
16. Is there any educational institution for women or co-education system?
17. Is there any medical centre, clinic or hospital available here?
18. How many physician working in this health complex?
19. Do you get any service from other sources? Local doctor (MBBS / Para-medical / non-medical degree)/Kabiraj/ Homeopathic.
20. Do you have market place? Yes/no.
21. Do you have any recreation centre? Yes/no.

### **Water supplies and uses**

22. From where you get drinking water? Public (Pond/ lake/ canal/ river/ deep tubewell / shallow tubewell/ rainwater)/ Private sources (Pond/ lake/ canal/ river/ deep tubewell / shallow tubewell)
23. How many gallon/litre of water you use for drinking / washing/ Bathing/ Cooking/sanitary purpose per day?
24. Does the sources of water are far way or near from your house?
25. Do you share water from the same sources with others? Yes/no.
26. If yes, where do you share? Pond / river/ canal/ tubewell / lake /other specific places.
27. Do you get enough water from the sources mentioned above in dry season or wet season or both seasons?
28. Where do you wash your cloths?
29. Where do you wash your body and face?
30. Do you use soap when you wash your body, face and cloths?
31. Do you have any idea or knowledge about water borne diseases like cholera, typhoid, hepatitis, malaria, diptheria, etc?
32. Do you think that water from various sources is drinkable or not or you don't have any idea?
33. Do you try to make it drinkable? Yes/ no  
If yes, what kind of purifying method you use for drinkable water? Boiling / filtering / use medicine / sedimentation / natural
34. Is there any institution or community worker involved for fresh water supply or use or both? Yes/no  
If yes, what kind institution? Govt. / NGOs / private/ other specific organisation.
35. Do you get any information for awareness about infectious diseases? Yes/ no.  
If yes, which media? Radio/ TV/ leaflet/ school/ health worker/other sources.
36. If you want to improve the quality of water what that could be?  
How would you suggest that improvements should be made?  
By whom you expect?  
Who should pay for the improvement? Individual/ union council/ NGO/ Government / others.

### **Sanitation information**

37. What kind of system do you have for sewerage?
38. Do you have own toilet or public toilet?
39. How many families share one toilet?
40. How many persons share one toilet?
41. What kind of toilet you use? Kacha (open) / environmentally sanitary) / Pakka (with Septic tank)
42. Do you face any trouble with the system you use for sanitation? Yes /no.
43. What kind of trouble? Smelling / overflowing (dry- wet season) / disease / linkage with the drinking water sources / others.
44. Is there any place / location for garbage disposal? Within the house / near the house / far away from the house / no specific place.







