



SOCIO-CULTURAL EVALUATION OF SANITATION HYGIENE IN SYLHET CITY OF BANGLADESH

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ABSTRACT

Sylhet, the northeastern divisional city of Bangladesh is a hilly area, where many ethnic minorities live. Their socio-cultural life is a little different from other people. The city is the main tea-producing and natural gas exploration region of Bangladesh. As a result of these extremely labor-intensive economic activities, a large number of low income workers live in and around the city, many of them are from ethnic minorities. The sanitation condition of low income areas is remarkably poor. Economic status, socio-cultural condition and topography of the region are the main reasons for this condition. This year long research work was undertaken to assess the existing sanitation condition of some low income areas of Sylhet city, find out the factors, responsible for the condition, monitor the behavioral changes of the dwellers, as well as health-hygiene improvement after taking some measures for improving the sanitary condition.

Keywords: income, socio, cultural, sanitation, health, hygiene, motivation, low cost, latrine, sylhet.

INTRODUCTION

The socio-economic condition of the northeast region of Bangladesh is different due to presence of hill tracts, tea gardens, forests, and mineral resources as well as for natural calamities. Sylhet is the major city of this region where a large number of low-income workers live in the slum areas. Landlessness, unemployment in the rural areas and facilities of the city are encouraging the migration of rural poor to the Sylhet city and making rush to the slum areas day by day. Like other cities of Bangladesh, living standard and overall environment, especially the sanitation situation in the slum areas of Sylhet city is miserable. Almost no latrines or urinals are observed here and the inhabitants often defecate at open spaces, hedges, drains and bushes. Only about 16% of the slum dwellers of Sylhet city have access to use sanitary latrines (Sarkar *et al.*, 2001). Moreover, the water they use for drinking and other domestic purposes is far below the permissible water quality standard. As a result many kinds of diseases spread by water, soil, flies, mosquitoes, air etc. The deteriorated sanitation situation causes severe environmental degradation in Sylhet city. Obviously, the improvement of the environmental condition of Sylhet city mostly depends on the improvements of sanitation condition of the slum areas. Any initiative for the improvement of such condition needs the knowledge of the baseline situation i.e. the existing situation of basic services. This study was undertaken to assess the existing economic, socio-cultural, water supply, sanitation and health-hygiene conditions of some selected low-income

areas of the Sylhet city; to identify the most suitable types of low-cost sanitary latrines for the community; to identify the constraints in installation and use of sanitary latrines and to monitor the behavioral changes as well as the health improvement after providing some low-cost sanitary facilities with the intensive motivational work for practicing appropriate defecation systems.

Health aspects of water-sanitation

Health is one of the most important targets for investing in water, sanitation and hygiene. While measurement of health improvements is extremely difficult, rigorous studies (Esrey *et al.*, 1985, 1991) have demonstrated conclusively that well-designed studies can make important contributions to health. Experience shows that the provision of water and sanitation technology alone without changes of hygienic behavior, will usually achieve little or no significant health improvement while water and sanitation improvements can be the spur to changes in hygienic behavior. Water affects health through helping and hindering the transmission of communicable diseases such as diarrhoea, scabies, malaria etc. Such type of diseases are characterized by the infectious agents such as bacteria or parasites, a human or animal host containing these agents, and transmission routes from old hosts to new hosts. Such communicable diseases with possible control measures can be classified as shown in Table-1 (Bradley, 1977; Cairncross and Feachem, 1993; Feachem, 1977; Webber, 1996).

**Table-1.** Classification of water related diseases.

Type of Water Related Infection	Examples	Morbidity around the world	Mortality/year
Faecal-oral Diseases	(a) Diarrhoea (b) Cholera (c) Typhoid fever (d) Roundworm (e) Hepatitis	(a) 1,000 million episodes/year (b) >300,000 (c) >500,000 (d) 20-40% rate of infection in developing countries like Bangladesh	(a) 3.3 million (b) >3,000 (c) >25,000
Strictly Water-washed	(a) Trachoma (b) Skin Infections (c) Scabies (d) Conjunctivitis	(a) 6-9 million blind (b) Very common, in millions	
Water-based (intermediate host parasite)	(a) Schistosomiasis (b) Guinea-worm	(a) 200 million (b) 1989- 890,000 1996- 35,000 - Still significant amount in developing countries	(a) >200,000
Water Related Insect Vectors	(a) Malaria (b) Filariasis (c) Dengue (d) Blindness	(a) 300-500 million cases (b) 128 million (c) 30-60 million infected/year	(a) 1.5-1.7 million

Source: Bradley, 1977; Cairncross and Feachem, 1993; Feachem, 1977; Webber, 1996.

Sanitation is the form of the management of human excreta. It naturally has great impact on excreta related diseases. Excreta related diseases are directly or indirectly transmitted through faecal material. With regard to the transmission of these diseases, there is a distinction between the state of being infected and the state of being ill. Often, the people who transmit the infection show few or no signs of having the disease, while the people who are not ill from a disease may be of little or no importance in its transmission (Cairncross and Feachem, 1983). The most important excreta related diseases could be classified according to their transmission routes as follows:

- Diarrhoeal diseases
- Worm infections
 - with no intermediate host
 - with an aquatic intermediate host
 - with an animal intermediate host
- Insect transmitted diseases (Feachem, 1983).

Sanitation in the form of the management of human excreta naturally has its greatest impact on excreta related diseases. Excreta related diseases and the likely effects of interventions after Cairncross and Feachem (1993) are discussed in Table-2.

Table-2. Sanitation related disease and the likely effect of interventions.

Category	Example	Dominant transmission mechanism	Likely effect of sanitation alone	Likely effect of hygiene promotion alone
Faecal-oral (non-bacterial)	Hepatitis A Amoebic dysentery Rotavirus Giardiasis	Person to person contact Domestic contamination	Negligible (as very low infective dose required)	Moderate
Faecal-oral (bacterial)	Cholera Salmonellosis Shigellosis Many forms of Diarrhoea	Person to person contact Domestic contamination Water contamination Crop contamination	Slight to moderate	Moderate
Soil-transmitted helminthes	Hookworm Roundworm Whipworm	Yard contamination Communal defecation areas Crop contamination	Great	Negligible



Category	Example	Dominant transmission mechanism	Likely effect of sanitation alone	Likely effect of hygiene promotion alone
Tapeworms	Beef tapeworm Pork Tapeworm	Yard contamination Field contamination Fodder contamination	Great	Negligible
Water-based helminthes	Schistosomiasis	Water contamination	Moderate	Negligible
Excreta-related insect vectors	Filariasis Some faecal oral disease	Insects breed or feed in sites of poor sanitation	Slight to moderate	Negligible

Source: Cairncross and Feachem, 1993.

MATERIALS AND METHODS

This research study was conducted for one year; first six months were spent for preliminary survey, motivational programs, installing sanitary units etc. while monitoring works were performed within the rest of the time. Five different slums (Table-3 and Figure-1) were selected from different wards depending upon population density, deteriorated sanitation condition, professions,

income status etc where necessary information and pertinent data were collected by visual inspection, questionnaire survey and using other participatory tools. For questionnaire survey at least twenty-five families were randomly selected from each study area. At the same time, gender issues were seriously considered in conducting survey works.

Table-3. Name, location and ID of the study areas.

Name of the slum	Location	Identity
Subhani Ghat	Southeast part of Sylhet city (Ward No. 15)	S- 1
Charadighir Par	Central portion of the city (Ward No. 16)	S- 2
Sheikh Ghat (Ghashitoola),	Southwest part of the city (Ward No. 10)	S- 3
Shubid Bazar (Bonkola Para)	Northwest part of the city (Ward No. 7)	S- 4
Lakkatura	Northern portion of the city (Ward No. 17)	S- 5
Akhalia (Included later)	Northwest part of the city (Ward No. 9)	S- 6

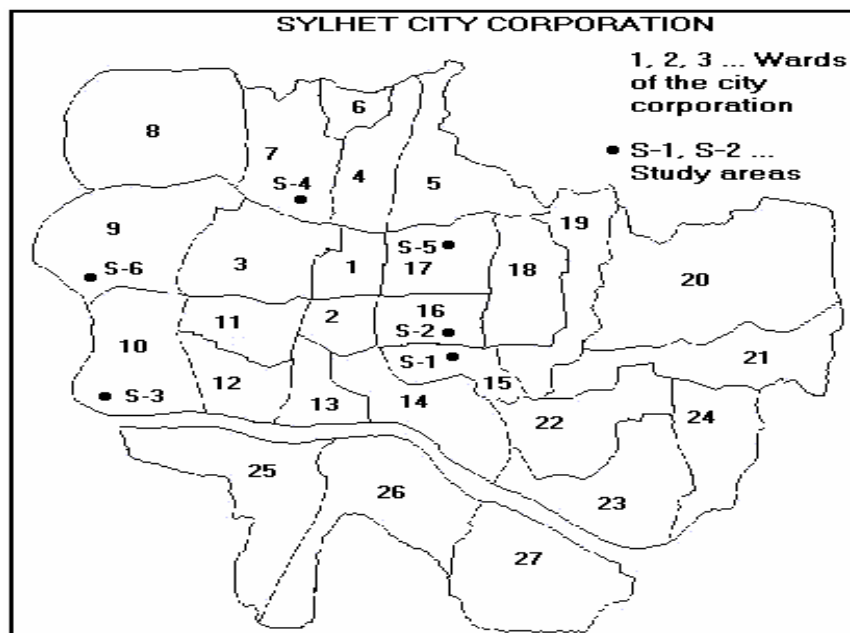


Figure-1. Location of the study areas are shown in Sylhet city corporation map.



Several motivational programs such as poster, distribution of leaflet and bill-boards, meetings and group discussion with residents and land owners, rally with colorful placard, lectures on health and hygiene etc. were conducted for building up their awareness about health and sanitation.

Some sanitary units of different types were installed with the active participation of the inhabitants by rendering voluntary works in these areas. During installation, some criteria were followed to choose location, number and type of latrines. Depending upon population density, availability of free space, educational and financial status, willingness of users for maintaining the toilets and willingness of landlords to provide lands, location for installation of toilets was selected. It can be mentioned that no one of the landlords of Subhani Ghat slum was interested to provide land for installation of toilets, Akhalia slum (Table-3) was selected instantly and information about its existing sanitation condition was collected. Number of latrines was determined on the basis of population density, number of families, willingness to share the latrine etc. A wide range of alternative low-cost sanitation technologies such as, simple pit latrine, single and twin ventilated improved pit latrine, reed odorless earth closet latrine, community latrines etc. are available in Bangladesh (Ahmed and Rahman, 2000). Among these single pit, twin pit and community latrines were selected for providing in study areas. Due to unwillingness of the slum inhabitants to share and maintenance complexity single pit latrine is finally selected for most of the study areas. Substructure of the toilets consists of RCC rings and slabs with water sealed pan while CI sheets for roof, bamboo for columns and beams and bamboo fence for

door and sidewalls were used in superstructure. For twin pit latrine, PVC pipes were used to interconnect pan, inspection hole and the pits and bricks were used for the construction of inspection hole.

The socio-economic and other constraints during installation and use of sanitary latrines were identified by close observation. The appropriateness of provided types of latrines was also evaluated. Regular monitoring was conducted for half a year to observe the behavioral changes of the communities and improvement of sanitation, as well as health-hygiene condition.

DATA ANALYSIS AND RESULTS

The existing situation

Socio- economic condition: To assess the income and educational level, at least twenty-five families from each study area were surveyed. It was found that most of the inhabitants are very poor with the monthly income lower than Tk. 4000 (US\$ 60) and illiterate; more than 50% slum people was completely illiterate even having no knowledge of ABC in four study areas out of five except S-3 while the literacy rate was found only 12% in one study area (S- 4). Tables 4 and 5 show the average income and educational level of the inhabitants in the study areas, respectively. Due to financial constraint they have no ability and willingness to pay for maintaining their health and hygiene condition. More over, most of them are not aware of sanitation especially excreta management and excreta related communicable diseases due to the lack of education.

Table-4. Average income levels of different study areas.

Study area	No. of families (%) on the basis of monthly income (TK*)		
	Below 2000	2000-4000	Above 4000
S- 1	11	79	10
S- 2	13	87	0
S- 3	4	66	30
S- 4	15	71	14
S- 5	28	72	0

* 1 US\$ = 67 TK approx.

Table-5. Distribution of educational qualification (%) of different study areas.

Study area	Educational Level (%)			
	Illiterate	Primary School	High School	Above High School
S- 1	52	44	4	0
S- 2	60	24	16	0
S- 3	24	48	24	4
S- 4	88	8	4	0
S- 5	51	41	8	0



Existing condition of water use: From survey works, it is observed there is no provision of piped water facilities in the study areas; most of the people except S-1, use tube-well water for drinking purposes. In S-1, there is only 10 tube-wells and no dug-well; due to serious scarcity of reliable water, 20% of the inhabitants are bound to use pond water even for drinking purpose. A

significant number of people of study areas have to depend on ditch/pond water for household purposes, which is very unhygienic. There are no treatment practices (e.g. boiling of water, sedimentation, filtration, coagulation) available to treat the water. Table-6 indicates the water-use pattern for household purposes rather than drinking in different study areas.

Table-6. Water use pattern for household purposes.

Study area	Sources of water (%)		
	Ditch/ Pond	Tube well	Dug well
S-1	90	10	0
S-2	15	80	5
S-3	10	55	35
S-4	10	90	0
S-5	15	60	25

Existing sanitation practices: Due to poverty and lack of proper sanitation knowledge the people of these areas are not accustomed to sanitation practices. The general sanitation facilities include low cost sanitary latrines, unsanitary latrines, open defecations (open space or near by 'chara', which means small canals). 49.83% of slum dwellers frequently use open space and 'chara' for

defecation purpose. Although on an average 50.17% people have some kind of sanitation options, in some places (S-2 and S-5), there is an acute scarcity of latrines. Some latrines were found using more than 100 times per day. The defecation condition of these areas is shown in Table-7.

Table-7. Distribution of latrine used in different study areas.

Study area	Defecation type (%)			
	Open defecation	Near-by drain/ chara	Unsanitary Latrine	Sanitary Latrine
S-1	12	16	64	8
S-2	12	60	16	12
S-3	16	24	36	24
S-4	8	28	44	20
S-5	36	32	24	8
S-6	30	25	30	15
Average	19	30.83	35.67	14.5

The following common problems related to existing latrine facilities at all study areas were identified during the survey period:

- Unhygienic latrines were the main sources of spreading diarrhoeal and other sanitation related diseases;
- Overflowing of excreta even in negligible flooding and rainfall occurred for most of the latrines;
- Due to absence of proper disposal facilities, location of many latrines might be changed;
- Large number of users per latrine compelled the users to wait in the queue at peak hours;
- Poor condition of latrines without shade did not permit regular uses in rainy season;
- Bad condition of or want of created privacy problem;

- Location of the sanitation units at higher places on the hills especially at Lakkatura tea garden discouraged the access of children to the latrine;
- Severe odor problem was observed in most of the places; and
- Views of the latrines were aesthetically very unpleasant.

Critical analyses revealed that a few factors such as Illiteracy, lack of knowledge about health and hygiene, poverty, want of free space, lack of willingness of the land owners and the dwellers, unwillingness to clean the latrine or empty the filled pits, behavioral problems, superstitions ("Women must not use the latrine after elder male in laws"- a common belief of the workers of ethnic minority groups of tea gardens), geographical condition (hilly areas) etc. are mainly responsible for the existing deteriorated sanitation condition.

Drainage: There was no provision of drainage facilities in any of the slums; in most cases kucha (earthen)



makeshift channels are used to remove the excess water from the immediate vicinity of the water sources without leading to any other main drainage system. Most of the existing drains remain blocked with garbage or solid waste; in wet season, the situation becomes worse when the slums remain water logged with deteriorated wastewater for weeks as the latrines becomes the source of faecal contamination by flooding since the flood water mixes with the excreta and spread the contamination wherever the water flows. Slums located adjacent to water bodies drain out wastewater to the water bodies thus polluting the water.

Solid waste disposal: No slum has any solid waste disposal facility, normally the inhabitants in these slums dispose off their waste at roadside bins, open spaces, water bodies and drains (resulting in clogging). Piles of rubbish in the bins, open spaces and at the roadsides provide a habitat for rats and flies contributing to the spread of a number of diseases like plague, leptospirosis and other infections as well as faecal oral diseases. Tin cans and tyres can contribute a significant breeding ground for Aedes mosquitoes that transmits dengue and yellow fever. Thus poor management of solid waste disposal in slum areas encourages rats, flies, cockroaches and other vectors of disease. Uncontrolled waste tips in poor slum areas are often found to contain faecal matter and become the fertile breeding grounds for pests.

Impact of vectors: Poor sanitation in the slum areas causes hazards from mosquito-borne and rat-borne diseases. With regard to excreta related insect diseases, septic tanks and flooded latrines in the wet season becomes a focus of Culex mosquito breeding; unhygienic kucha (earthen) lots becomes temporary but dangerous breeding grounds for malaria carrying Anopholes mosquitoes.

Diseases and hygienic condition: Due to unhygienic sanitary conditions and inadequate water supply facilities many waterborne and excreta related diseases such as diarrhoea, amoebic dysentery, bacillary dysentery, typhoid, cholera, salmonellosis, shigellosis, dengue, yellow fever, jaundice, schistosomiasis, filariasis, plague, leptospirosis etc. are commonly occurred in all study areas. It may be noted that children are more sensitive to the diseases.

Constraints identified during installation of sanitary latrines

During installation of sanitary latrines, many problems were encountered in different locations. Location wise problems at the time of installation of sanitary latrines are summarized as follows:

Location: S-1

- None of the inhabitants of the site was interested to provide land for installation of toilets. So this site was abandoned for further study.

Location: S-2

- Landowners and users were not co-operative in latrine construction.
- Suitable place for the installation of sanitary latrine was not available.
- Landowners were interested to install the latrine near the drain so that they can connect it to the drain when the pit would be filled up as they thought the disposal of waste from the pit would be cumbersome.
- In some cases landowners were found to hesitate to take any financial support for installation purpose of the latrines from any financial source.

Location: S-3

- Being the location near the river Surma, water level fluctuated with variation of season.
- Landlords were cooperative during the installation works while the renters were not interested as they were afraid of increased house rent.

Location: S-4

- During the installation some house owners showed non-cooperative attitude.
- In some cases, the users strictly prohibited installing of latrine when they came to know that the waste would not be disposed to the drain, though they initially were agreed to install the latrines. They thought that disposal of waste from the pit would not be their job.
- Some of them took the project as a complex and clumsy since it required proper management and maintenance.

Location: S-5

- The users were more interested to defecate in the open space rather than a latrine because, they thought that inadequate water in the locality might clog the system and increased the complexity.
- Suitable place for the installation of sanitary latrine was not available.
- It was very difficult to fetch water to the place of installation as the sources of water were far from there.

Location: S-6

- The soil of this location was very unstable for excavation.
- Skilled mason was not available.
- High table of ground water of this location increased complexity in installation.

Monitoring and Evaluation

The situation revealed from monitoring works is presented below:

Awareness building: Most of the people especially women were conscious about sanitation after motivational works. Hygiene practices were being developed among them due to providing sanitary latrines. They used the latrine regularly and helped their children



to do so. The major problem related to defecation of women was privacy, which was remedied by the provided latrines. During the monitoring program, the inhabitants demanded more latrines indicating the keenness of the people to use sanitary latrine.

Effects on sanitation practices: Open defecation was remarkably reduced after intensive motivational works and providing sanitation facilities, which reduced the spreading of various diseases. The areas became almost

free from odor and diseases. Before undertaking the research work, only 14.5% of the targeted dwellers were observed using sanitary latrines while the figure sharply increased to almost 78% (as shown in Figure-2). It was observed that the inhabitants of the study area were more aware of hygiene practice and the most of them were found to use soap or at least ash to wash their hands after defecation.

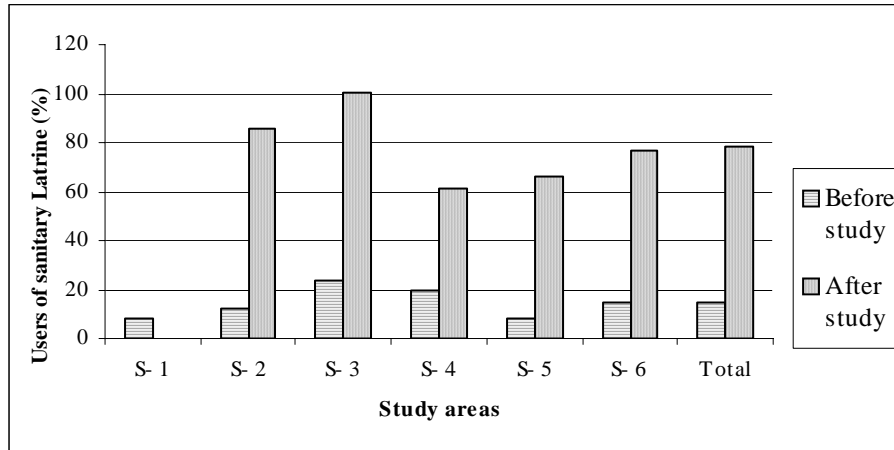


Figure-2. Percentage of sanitary latrine users before and after the research work.

It was found that some people did not use sanitary latrines even after providing these free of cost (except study area S-3). The following reasons behind this were identified:

- Inadequate water sources near the latrines;
- Perceiving thought that the latrine is prestigious for the family, which must not be used by mass people, but only by the guests;
- Perceiving superstition in the low cast ethnic peoples that women must not use the latrine after elder male in laws. Such low-cast ethnic people

are 'Hindus' by religion and were migrated by the then British owners of the tea gardens during 19th century from the economically oppressed part of southern India;

- Unwillingness to share the latrines; and
- Tough topographical condition (hilly areas).

Figure-3 shows the number of inhabitants who got the facility to use the provided latrines and the number of them who use it.

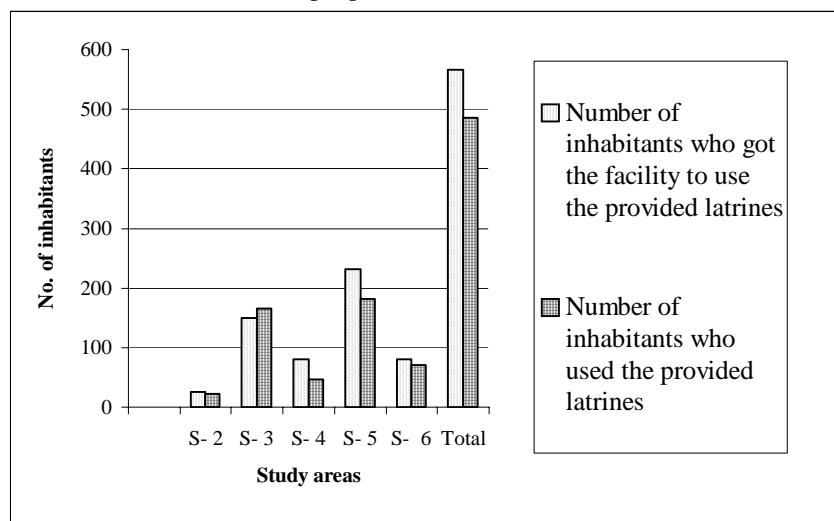


Figure-3. Number of inhabitants who got the facility to use the provided latrines and the number of them who used it.



Effects on children's defecation practice: Children's defecation practice is the main obstacle to establish sanitary environment in the low income communities, because many parents think that the children's faeces are not harmful as of adults. After intensive motivational works many parents were trying to send their children to latrine for defecation. It was also observed that some parents are asking their children to wash hand after using latrine.

Effects on health: Health condition of the people of the concerned area improved to some extent. During the monitoring program it was found that many diseases specially water borne diseases has been reduced. Before installing the latrines, the faeces were scattered here and there around their houses. Thus often they suffered from faecal borne diseases. Due to the use of the sanitary latrines by more people, the scope of spreading of faecal borne excreta related diseases reduced significantly.

Maintenance of the latrines: From the monitoring it was found that, active participation of the beneficiaries at different stages of the program made them more responsible for use and maintenance of the toilets. House owners and caretakers were supposed to maintain the latrines properly and in most cases they tried to do it properly. However, somewhere the latrines were not flushed with adequate water, which clogged those. One of the reasons for lack of care for maintenance of the latrines may be that the users did not have to make any financial contribution.

DISCUSSION

Sanitation Practice in Bangladesh

The actual use of sanitation facilities may show great variations; latrines may be converted into maize stores or hencoops, just as in the past Dutch bathroom showers were often used for storing coal. Skoda *et al.* (1977) reported a 59.9% use of latrine (46.2% are open over hang type) for adults usually women but only 12.8% for children in 120 villages of Bangladesh.

The case study of Sylhet city showed that among the traditional latrines, single pit, twin pit and community

latrines, twin pit latrine required more space, high cost and excessive water for cleaning. Moreover, due to unwillingness to share and complexity in maintenance, twin pit latrine was found not feasible for installation in most of the places. Such disadvantages were also found in case of community latrine although its installation cost is less than other types of latrines. Thus single pit latrine was found more suitable for the study areas.

After the execution of the study, improvement of sanitation condition was excellent as the use of sanitary latrines increased from 14.5% to almost 78% (Figure-2). In the study area diseases especially water borne diseases like diarrhoea, bacillary dysentery, typhoid, cholera, dengue, and jaundice were reduced. Due to the use of the sanitary latrines by more people, the scope of spreading of faecal borne excreta related diseases such as hepatitis A, malaria, amoebic dysentery, salmonellosis, shigellosis, schistosomiasis, filariasis, etc. reduced significantly.

Hand washing after defecation is very important for sanitation practice. In the study area, it was also observed that parents were asking their children to wash hand after using latrine. Research conducted by International Center for Diarrhoeal Diseases, Bangladesh has indicated that as a rubbing agent, soil was commonly used by 40% of the user, soap by 29% of the users while it was reported unaffordable by 81% of the non users (31%). A classic study in Bangladesh showed that the simple practice of washing hands with soap after defecation was sufficient to reduce the secondary attack rates if dysentery within the participating families by 85 per cent (Khan, 1982). Another relevant study showed that hand washing with soap and water after contact with faecal material can reduce diarrhoeal diseases by 35% to more. Using a clean pit latrine and disposing children's faeces in a pit can reduce diarrhoea incidence by 36% or more (Almedom *et al.*, 1997). Hand washing was positively associated with better social and economic indicators including education of the women.

A few epidemiological studies showed that diarrhoeal morbidity reduces significantly by proper interventions of sanitation improvement as shown in Table-8 (DFID, 1998).

Table-8. Epidemiological studies on diarrhoeal morbidity reduction by proper intervention.

Type of Sanitation Intervention	No. of Studies	Median % Reduction
Water and sanitation	2	30
Sanitation	5	36
Water Quality and Quantity	2	17
Water Quality	4	15
Water Quantity	5	20
Hygiene	6	33

Source: DFID, 1998.



Perceived beliefs, attitudes and cultural views prevailed in Bangladesh

The following beliefs and attitudes about health and sanitation found to be perceived in the poor people of rural areas and urban slum in accordance with the conducted field studies in Bangladesh.

- running water is always safe;
- the faeces of children are harmless;
- the excreta of babies and little children are not harmful;
- sweet or sugary food is the cause of worm infection;
- defecation in the open space by the children is a common practice;
- cattle do not pollute water;
- washing with cold water causes disease; and
- “women must not use the latrine after elder male in laws”- a common belief of the workers of ethnic minority groups of tea gardens.

Such beliefs can set very strict norms for behavior especially when they are the part of whole system of the ordering and classification of the society. In addition, more general attitudes may exist on the causes of disease in general and water-related disease in particular, on their seriousness and on their avoid-ability. Majority of the slum people have no sufficient knowledge of the relation between water, sanitation and hygiene and do not take diseases seriously or think that they have a natural immunity or that they will not be exposed to them. Thus some traditional behaviors may not be based on the understanding of disease transmission.

Economic and financial aspects of sanitation from Sylhet study

Economic viability and financial ability of the poor peoples of rural and poor slum areas who live on from hand to were considered to be one of the vital factors during the implementation of sanitation projects. From this point of view, latrines were distributed to the poor people of the slum areas of Sylhet city free in the study area. However providing sanitation facilities free of cost were not always fruitful, case study showed that due to free of cost maintenance of latrines were neglected such as the latrines were not flushed with adequate water that clogged those owing to the no financial contribution of the users. A few of the inhabitants and landowners of the study site were not interested to provide land for installation of toilets free of cost especially for community latrines keeping the commercial value of land in mind. In some cases landowners were found to hesitate to take latrine sets free of cost or with financial subsidy.

CONCLUSION AND RECOMMENDATIONS

The yearlong sanitation study in the selected slum areas of Sylhet city brought the following changes in sanitation and health practices:

- Overall health and sanitation condition of the study area was worse before starting of the research work. Poverty, lack of knowledge and awareness about health and hygiene, unwillingness, superstitions etc. were responsible for the deteriorated condition of the sanitation system. The situation tremendously improved as a result of the intervention.
- Concentrated motivational works, such as postering, meetings, rally with colorful placards and festoons, lectures on health and hygiene, group discussions etc. on targeted people remarkably changed their behaviors, attitudes and superstitions about their defecation practices.
- Due to poverty most of the people cannot afford the sanitary latrines, although they became aware of healthy sanitation by the motivational works. Providing latrines free of costs improved the sanitation condition of the locality significantly.
- Voluntary participation of the inhabitants at different stages of the program made them responsible for using and maintaining the toilets properly.

On the basis of field observations and analysis of the gathered information from the relevant studies the following recommendations may be proposed for further improvement of sanitary condition of low income community in Sylhet City:

- Beneficiary participation must be ensured while taking any initiative for the development of the existing sanitation condition.
- Extensive educational programs and publicity through mass media, meeting, postering, motivational lectures to the general public etc. should be undertaken to increase the awareness of the people about the health and hygiene practices and the environmental pollution.
- Steps should be taken to improve water supply system in parallel with providing sanitation facilities to maintain healthy sanitary environment.
- Water related control measures including the increase of the use of water in quantity, improvement of water quality, restrict contact with polluted water, focus on destruction or restriction of insect breeding sites although not much in domestic water supply should be initiated.
- Necessary disposal facilities of wastewater should be upgraded.
- Selection of type and quantity of sanitary units should be made according to the users' numbers.
- Monitoring program should be continued for a long period to enhance the achieved improvements about sanitation in project areas.



- For hygiene promotion, the following three areas of particular attention may be considered on priority:
 - Safe disposal of children's stools;
 - Washing of hands with soap after defecation and before touching food; and
 - Safe storage of water in the households.
- Experience from others, like different GOs and NGOs working for sanitation, academicians and civil societies should be shared to get better results.
- Sylhet City Corporation should involve an appropriate Health Specialist to investigate and address the epidemiological and the inherent health risks prevailed from poor sanitary condition in the slum areas.
- Regular consultation with the vector control staff of Sylhet City Corporation should be introduced that can help to establish how serious the problems may be and may forestall the possibility of sanitation improvement actually making the situation worse.
- Due stresses should be given into the age distribution of sickness and death associated with poor water and sanitation to look at where children become infected and where children spread infection.
- The strategic sanitation to affordable services to the urban poor of slum areas may also be introduced. In this regard, sanitation investment may be demand based in operational terms, and the institutional arrangements need to be incentive driven giving emphasis on (Wright, 1997) as:
 - Providing technical support to the community level;
 - Widening the technological options;
 - Assessing sanitation demand;
 - Unbinding sanitation investments to permit incremental improvements at affordable costs; and
 - Homogeneous financing and cost-recovery.
- Involvement of civil society especially the women should be ensured in the all stages of the sanitation improvement projects from planning and design to the construction as well as operation and maintenance.
- Cooperation between government authorities and communities could be most effectively promoted by involving private sector actors, such as formal and informal enterprises, community based micro-enterprises and NGOs with private sector characteristics.
- Local consultants, experienced in development activities through community participation, should be employed.
- The technology chosen should effectively deal with the priority problem and be affordable by the people and the community organization should determine how to implement the programs with technicians supervising the work being done.
- Further studies on sanitation improvement in large scale should be implemented to cover all the low-income areas of Sylhet City.
- Finally integrated water supply, sanitation and hygiene promotion programs aiming at maximum health benefits targeting poor communities at the slum areas using a demand-responsive and a process approach should be designed and implemented subsequently.

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