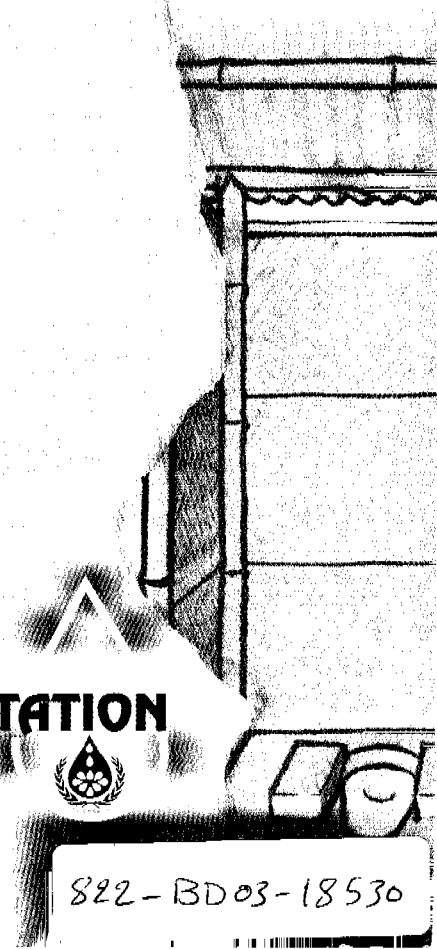
Impediments Toward Sanitary Latrine Coverage: The Case of Rural Bangladesh

Prepared By

Research, Monitoring & Evaluation Cell



NGO FORUM
FOR DRINKING WATER SUPPLY & SANITATION

Impediments Toward Sanitary Latrine Coverage: The Case of Rural Bangladesh

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Foreword

NGO Forum for Drinking Water Supply & Sanitation is the apex networking and service delivery agency of NGOs, CBOs and private sector actors who implement water and sanitation programmes for the unserved and underserved communities living in the rural and urban areas of Bangladesh. Currently NGO Forum works in a countrywide decentralised mechanism through around 635 partner NGOs and 299 private sector actors with total manpower strengths of more than 38,000 workers. NGO Forum has divided its entire working area into 14 regions.

Since 1982, NGO Forum has been working to improve the WatSan status of the disadvantaged people of Bangladesh through providing hardware and software supports. In recent years, NGO Forum, as the apex body is giving special attention on the production of BCC material, Support services through its Resource centre, enhancing the capabilities of WatSan partners, initiating Research activities to ensure contribution for the entire WatSan sector.

Presently, NGO Forum is undertaking several action researches related to, arsenic mitigation, WatSan Mirco Credit, Rain Water Harvesting Systems, and Waste management.

Besides these action researches Research Monitoring and Evaluation Cell (RME) conducted a study in the last half of 2002 with the assistance of Field Operation and PNGOs to know the environmental suitability, and people's acceptability of the promoted latrine technologies to enhance effectiveness of the programme intervention. I appreciate the role of RME Cell in conducting the study and preparation of the report. The findings of this study would be useful to ensure effective intervention in the sanitation sector. I am sure that this study report would also be useful for other organisations those are working in the sanitation sector particularly in Bangladesh.

S.M.A. Rashid
Executive Director
NGO Forum for Drinking Water Supply & Sanitation

Acknowledgement

In doing the research we had support from many. We are grateful to Mr. S.M.A. Rashid who not only supervised the study but also provided guidance, advice and moral support to prepare the report. Moreover, he is the person who first felt the need to conduct a research on the latrine coverage and directed us to initiate the research.

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Last but not the least many thanks to all colleagues of the RME Cells for providing the moral support to undertake the study.

Avizit Reaz Quazi
M.Phil., Ph.D.
&
Mahmudur Rahman Chowdhury

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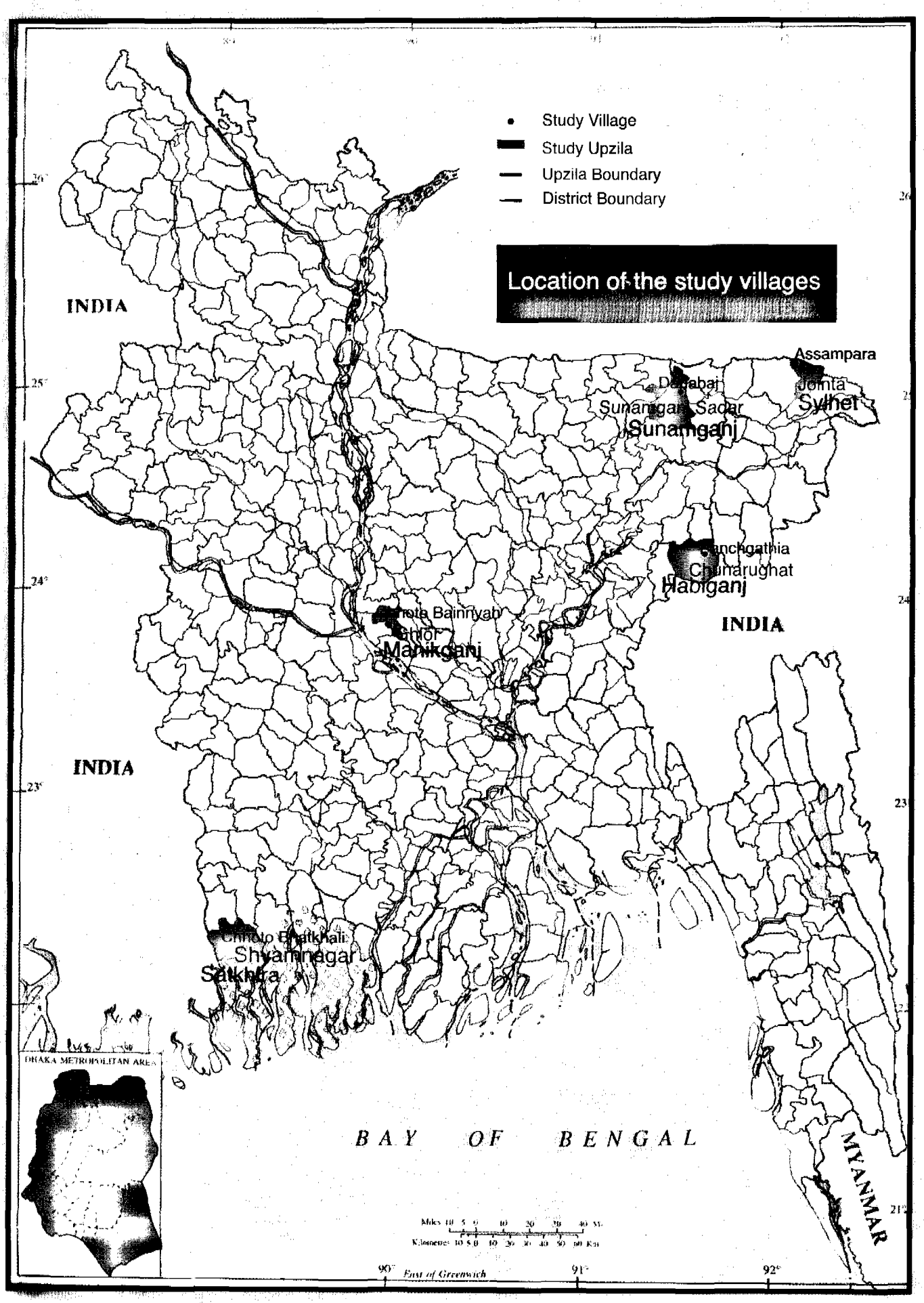
Glossary

ASA	Association for Social Advancement
BRAC	Bangladesh Rural Advancement Committee
CBO	Community Based Organization
CCDB	Christian Commission for Development in Bangladesh
CHT:	Chittagong Hill Tracts
DPHE:	Department of Public Health Engineering
Gooseneck/Syphone	Part of the pan, which is used to ensure the waterseal of the waterseal Latrine
Hanging latrine:	Elevated latrine structure with an open area below allowing faeces to fall into a water body, or on the ground. Hanging latrine typically built around the edge of a pond, canal, or a ditch.
HH	Household
Latrine Structure	Lower portion of the latrine including slab and pit(s)
Latrine Superstructure	Upper portion of the latrine that ensure privacy of the user
LGED	Local Government Engineering Department
LGI	Local Government Institution
MFI	Micro Finance Institution
NGO	Non-Government Organization
NGO Forum	NGO Forum for Drinking Water Supply and Sanitation
Offset Latrine	It is a Water seal latrine but only difference with the ring slab is that instead of direct pit a completely off-set pit connected to the pour-flush pan by a short length of 100 mm diameter pipe.
Open Latrine	Latrine that is connected by pipe to an open place or water body is called open latrine. Moreover, all those septic/pit/offset/water seal latrine that fail to keep excreta within the tank/hole due to damages and excreta come out in the open place are treated as open latrine.
Proper pit:	Latrine that effectively isolates faeces from the open environment
PNGO	Partner Non-Government Organization
RDRS	Rangpur Dinajpur Rural Service
RME	Research Monitoring and Evaluation Cell
Safe Water:	Water free of bacterial and unacceptable level of mineral & chemical contamination and does not have immediate or latency affect on the human health if consumed or used.
Semi-Hygienic latrine	Latrine have proper pit (pit latrine)
Sanitary/Hygienic latrine	Latrine that effectively isolates faeces from the open environment, Control Odour, Control insect, and Assure at least minimum level of convenience and privacy
Simple pit/ pit Latrine	It consists of a manually dug hole into a ground, a seat or squatting slab, and a superstructure erected over it
TW	Tubewell
UNICEF	United Nations Children's Fund
UP	Union Parishad
VERC	Village Education Resource center
VSC	Village Sanitation Center
Waterseal latrine	One kind of pour-flush latrine builds with the modification of simple pit. Popularly it is known as Ring-Slab latrine
WatSan	Water and Sanitation


Study Village
Study Upzila
Upzila Boundary
District Boundary
Location of the study villages
INDIA
Assampara
Jointa
Sylhet
Sunamganj Sadar
Sunamganj
Habiganj
INDIA
Manikganj
INDIA
Shyamnagar
Satkhira
DHAKA METROPOLITAN AREA
BAY OF BENGAL
MYANMAR
90° East of Greenwich
91°
92°

Chhoto Bhatkhali village

Interview with key informants (Mason)
Chhoto Bainnyah

Conversation during transect walk
Chhoto Bhatkhali

Interview with key informants (UP Member)
Chhoto Bainnyah

Conversation During transect walk
Pachgathia

Focus Group Discussion
Pachgathia

Focus Group Discussion
Pachgathia

Focus Group Discussion
Assampara

Focus Group discussion

Chhoto Bainnyah

Focus Group discussion

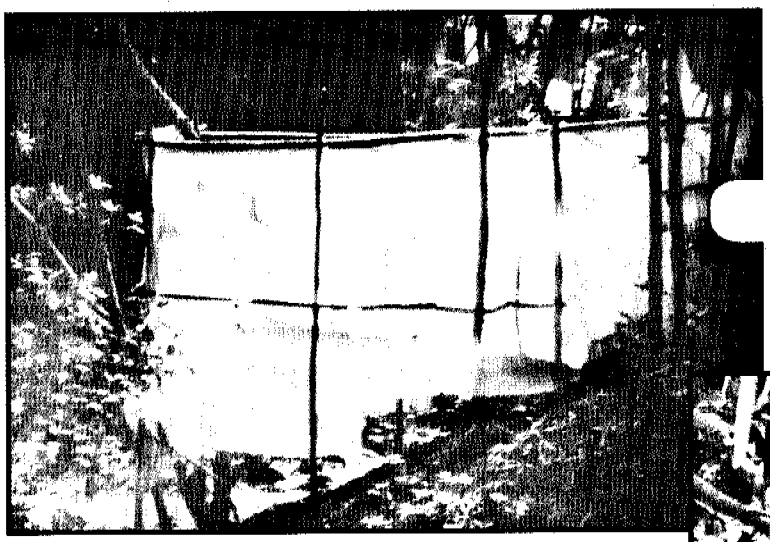
Chhoto Bainnyah

Interview with key informants(Quack)

Chhoto Bainnyah

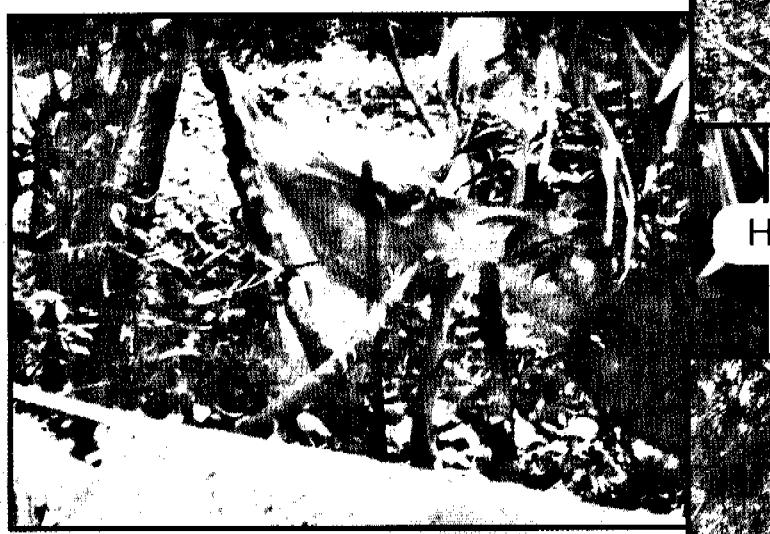
Focus Group discussion

Chhoto Bainnyah



Hanging Latrine
Dariabaj

Hanging Latrine in Flash-flood
Dariabaj



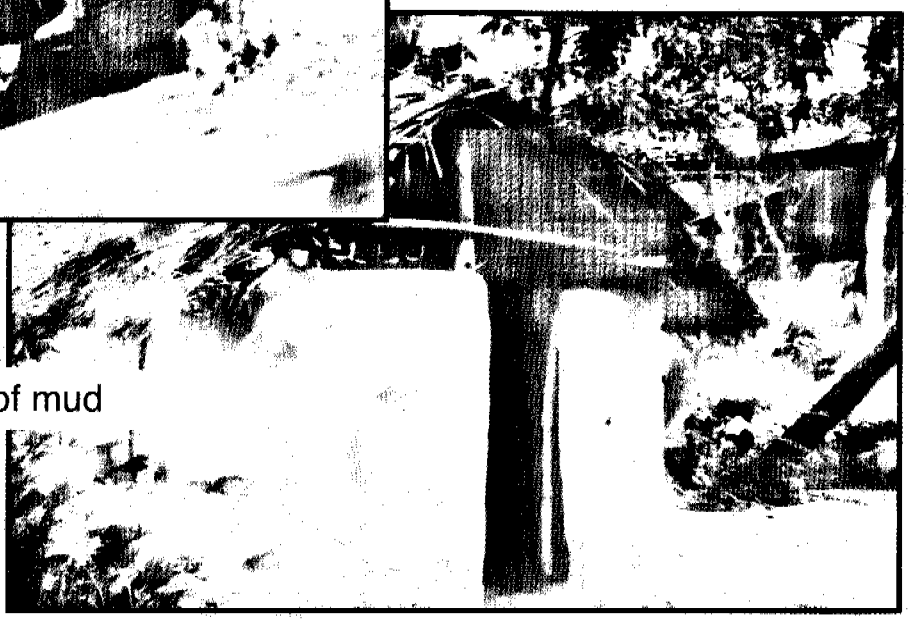
Hanging Latrine
Dariabaj

Offset pit is visible
Chhoto Bainnyah

Improper pit of a waterseal Latrine
Chhoto Bainnyah

Latrine damaged by flush flood

Dariabaj



Latrine superstructure made of mud

Pachgathia

Pipe extended from the latrine is visible

Chhoto Bhatkhali

Offset pit of a waterseal latrine is visiable

Chhoto Bainnyah

Executive Summary

Decades of interventions by several national and international organizations have brought a remarkable improvement in latrine coverage, however, still the sanitation condition in rural Bangla as a whole is dismal. Currently, only 41 percent of the rural population have acceptable sanitary systems for hygienic disposal of excreta. Moreover, use of latrine by all household members, and maintenance of hygienic conditions of the latrine of the people of Bangladesh presents further gloomy picture. Each year 110,000 children die in Bangladesh of diarrhoeal diseases.

This context invigorates NGO Forum for Drinking Water Supply and Sanitation to initiate the present study to identify whether there is any relationship between the designs of sanitary latrine technologies available in the rural area of Bangladesh and the present poor sanitation conditions.

Initially attempt was made to meet the study purpose through literature review. A number of published and unpublished documents on Water & Sanitation were reviewed to gather information on people's view on latrine technologies available in Bangladesh. However, only few documents were found those have some relevancy with the present research. All of the documents except one (DPHE-UNICEF-WHO, Oct 1983) are peripheral. Only little information of them is relevant. The dearth of relevant information based on the recent finding directed the researcher to initiate a field study to address the present study problem.

Subsequently, field study was planned and commenced in late December 2002 to grasp the field facts such as latrine coverage, types of latrine available in the areas, people views on latrine technologies, and factors those are hindering sanitary latrine coverage and proper maintenance of sanitary latrines. On the basis of environmental category five non-intervened villages of NGO Forum were selected for field study. Pachgathia (plain land), Assampara (hilly & stony) Dariabaj (flash flood affected), Chhoto Bainnyah (flood affected village) and Chhoto Bhatkhali (saline affected), villages were selected from Habiganj, Sylhet and Sunamganj, Manikganj and Satkhira districts respectively.

During the field study, conversational interview, group discussion, transects walk and observation methods were followed to gather necessary information. WatSan field staff, Masons/mistries/latrine producer, Local Doctors/Quacks, local leaders, teachers were interviewed primarily to gather information regarding socio-economic status of the village and villagers, environment and health status, sanitation status, hygiene related behaviour of the people, while group discussion was facilitated to know their views regarding defecation practices and, sanitary latrine technologies and components.

According to the field study most of the adults of the study villages except few use some form of latrine for defecation while all most all under five children practices open defecation. According to the field findings, few adults and almost all under five children practice open defecation due to following reasons:

- *Lack of awareness about the health risk of open defecation*
- *Not having access to latrine*
- *Sudden raise of family dispute, among the households who share latrine, sometime drive family members for open defecation for a temporary period*
- *Not having latrine in the working places is responsible for open defecation during working hours.*
- *Types of latrines, which households can afford, are not convenient, comfortable and pleasant ones. As a result a small number of adult people taking advantage of darkness and desolate places like riverbank, crop field and bushes, practice open defecation*
- *Caring attitude of the parents to a large extent is responsible for open defecation by their children. Parents encourage children to defecate in open places from where they can keep an eye on their children as they perceive latrine as unsafe for children and envisage the possibility of accident*
- *Children fear to defecate in a place from where they cannot see any one they can rely on*

Like open defecation, there are specific reasons for which most of the adult population use latrines for defecation. These include privacy, cleanliness, convenience, social status, and health aspects. All the respondents mentioned that they use latrine primarily to maintain privacy and cleanliness. The health and social status along with these issues were also considered by a marginal number of respondents. Findings further shows that nearly half of the households use unhygienic type of latrines. Among the rest households, majority use waterseal direct pit, some use simple pit latrine, few of them use waterseal offset pit latrine and a very marginal number of households use two-pit latrine.

However, observation reveals that many latrines, which generally fall under the pit and various types of waterseal latrine lack essential features of semi-hygienic and hygienic latrines respectively. It was noticed that gooseneck/syphone of majority waterseal latrines were improper or totally absent and excreta in some of the pits of simple pit, waterseal direct pit and Offset pit latrines do not remain sealed as the pits are not proper or a pipe is connected with the pits that exposes excreta in open environment. This means though majority households have some sorts of latrine, but very few of them can be considered as hygienic. Why is it so? Study shows that lack of awareness, environmental constraints, and not having easy access to hardware components are the factors responsible for this situation.

Study reveals that people lack, awareness on the issues like health risk in using unhygienic latrine and, clear idea about the essential features of the hygienic types latrine. Most of the people use latrine to maintain privacy and cleanliness and give importance to superstructure rather than structure. Even most of the people do not have idea on waterseal aspect and importance of having proper pit.

The popularizing of the waterseal latrine as ring-slab latrine has seriously narrowed down the people's understanding of sanitary latrine and diminished the importance of waterseal issue. Most of the people feel that once they have latrine made of rings and slab they become the possessors of standard type of latrines, which address the social need. Due to this ignorance about the function of gooseneck/syphone, most of the users buy slab without gooseneck/syphone or break it.

However, some people have sketchy understanding about the function of gooseneck/syphone. According to few respondents gooseneck/syphone reduce the spreading of foul odour while a marginal number of respondents highlighted an issue, which the inventor of waterseal latrine even might not have thought. According to them it protects the user from the backsplash of the pit sludge.

Like the waterseal, people do not have clear idea about the importance of proper pit. The main purpose of having a pit is to confine the excreta in a way that it does not get exposed to open environment. However, most of the people connect it with cleanliness. They think that use of a pit help to keep the homestead clean by restricting the exposure of excreta to domestic animals and poultry. Therefore people do not feel wrong to build hanging latrine on water bodies or releasing excreta into the water bodies from the pit through extended pipe or through creating breach between rings during flood as it does not affect the cleanliness of the homestead. It has been observed that a considerable number of households in Chhoto Bhatkhali are using long pipes to release excreta in the nearby canal while majority waterseal latrine users of Chhoto Bainnyah informed that they release excreta from the pit during flood. As a result they do not need to spend money to make the pit empty.

Apart from lack of awareness, certain environmental features of study area raise difficulties to maintain hygienic conditions of the available hygienic types of latrine and sometimes tempt to use unhygienic latrines. People of flood affected and flash flood and swamp surrounded areas complained that they face space constrains to install hygienic type of latrine. They argue that they have to raise the height of the homestead with earthwork to reduce the effect of flooding and this raising of the height of the homestead requires money, labour and time. This ultimately compels people to have much smaller homestead than the plain land area and face space constrain to install latrine besides building house, courtyard. The issue becomes further complicated as the people prefer to install latrine at a certain distance from the residence.

Therefore people prefer to install latrine in a way that ensure less occupation of space in homestead. This ultimately encourages people to take various unhygienic steps. These are: building of hanging latrine, install latrine structure on the ending edge of the homestead, construct latrine structure with rings in a way where a portion of the ring structure remains within the ground of homestead and the rest remain in the open air, and use offset ring pit where the pit is build outside the homestead and major portion of the pit remain visible.

In the last three options people use sanitary types of latrine but the problem of soil erosion, improper joining of rings whither away the hygienic conditions of the structure of the latrine.

People of flood affected and flash affected area also complained that current, wave and pressure of the flowing water spoils the latrine pit by the erosion of surrounding ground. Even some times they wash away the entire latrine structure. The people of hilly and stony area do not face these problems but they face another type of environmental problem that raise difficulties to use waterseal latrine. They argued that latrines with gooseneck demand more water for cleaning which is ultimately responsible for the quick filling up of the pit due to the stony nature of the soil.

Easy water access is very much essential for maintaining the hygienic condition of latrine. However, study shows that every body does not enjoy this condition. People in coastal and hilly regions face scarcity of water that causes difficulties in maintaining hygienic condition of a latrine.

Besides above difficulties, not having easy access to latrine hardware and Inferior quality of latrine components also restrict the sanitary latrine coverage. In many cases, Village Sanitation Centres (VSC) are located in far distance from the households. The access becomes more difficult when proper communication facilities are not available. Furthermore, even if they have access to VSC It does not ensure that the quality of latrine components will be satisfactory. Findings shows that goosenecks of most of the concrete pans are not constructed properly. Even the quality of the material used to construct the gooseneck is so inferior that it breaks when stool falls on it. It is also observed that some production centres produce slab without Gooseneck.

One of the interesting findings of the study is that it contradicts the general assumption of the people that lack of financial affordability is one of major reasons for low sanitary latrine coverage. Only a few of the respondents raised the affordability issue. The presence of economic opportunities, sanitation related credit programme and distribution of latrine in subside price, in the study area might have roles for this situation. Therefore, this position of the people may be unique for these studied villages and might not be true for others.

Another interesting finding is that almost all respondents have reservation about the way sanitation promoting organisations address the affordability issue. According to them most of the organizations' promotional activities highlight the structure of the latrine and therefore do not incorporate the cost of superstructure, transportation and installation when they address the affordability issue. They argued that service providers by highlighting only the structure of the latrine attempt to diminish the importance of the affordability issue.

Moreover, a considerable number of respondents whose income comes through daily activity wise (Shop keeper, day labour, Rickshaw puller etc.) were not ready to buy the arguments that construction of pit and superstructure do not involve any expenses as they themselves can do it. They argue that their involvement with the pit and superstructure construction means loss of income during that particular period.

The counting of all these expenses is important for them because they think that the poor households would need credit without interest for installation of sanitary latrine and credit amount should be considered on the bases of all expenses those are associated with the entire latrine installation process.

One of the major purposes of the study was to know people's preferences and views on latrine design and its components. However, absence of various types of latrines, promoted by various organizations in most of the studied villages restricted the opportunity to elicit people's relative preference among sanitary latrine technologies. However, the finding shows that people are very much clear about the issues which latrine hardware should address.

Most of the people living in the study area do not have idea on various types of sanitary latrine technologies. As a result they are not in a position to compare various types of latrines to reveal their preference. However, almost all the people revealed that their preference of latrine technology will be considered by some factors related to affordability, use & maintenance, convenience and social aspects. They will prefer a latrine which provides maximum privacy, easily cleansable, requires minimum amount of water for cleaning, durable for longer period, financially affordable, restrict foul smelling, emptying of pit easily possible, requires less space for installation, components are easily movable, and not vulnerable to natural calamity.

According to the study, most of the people fail to provide opinion on the latrine technologies available in the area but almost all the respondents provided opinion on the various components/parts of the latrine technologies available in the area. These components/parts include flat part of the slab, footrests, pan, and gooseneck/syphone.

In the study areas slabs available in the market have two separate designs. These are: 1) Circular slab and 2) Square slab. However, majority of the people showed their preference for square design and the rest showed preference for Circle type slab. Both groups provided reasons for their preference. Most of the people prefer square slab because it provides, more space within latrine than the circle one, better support for the construction of superstructure, more durable (Slab producers informed that they use better material for the construction of square slab) and during rainy seasons, mud of the four corners of slab do not spoils the whole slab which happens in the case of circle slab.

However, considerable portion of respondents prefer circle slab because rings are circular so circle slab fits well on it. They further argue that problem with the square slab is that, four corners of square slab are sharp and thin and most often they break. Moreover, cost of the square slab is more than circle one. The latrine producers confirmed this cost aspect. They informed that the cost of the square slab is higher (20 to 40 taka) than that of the circle slab primarily for two reasons: 1) for extra space of the four corners it needs more material for construction 2) better material are used for square slab.

Apart from the slab designs people always reveal their views about the footrest of the slab. Almost all people showed their reservation over the height of footrest of slabs available in the market. Only few respondents have showed indifferent attitudes over the height of the footrests.

The footrest of the slabs available in the market generally is one inch to one and half inch heights. However, people want that the height of the footrest should be two and half inches, which a brick generally has. Producers are also very much aware about the preferred height but still they promote footrest with less height to keep the construction cost minimum. People like to have higher footrest primarily for two reasons. These are: 1) When the height is less they feel a sense of aversion due to the closeness with the unclean pan 2) During urine and Water use it back splash in the leg.

With respect to pan, almost all people showed their preference for plastic pan to concrete pan. People prefer plastic pan because, it has better looks, more durable, easy to clean and need less water to clean.

Nevertheless most important finding of the study is that almost all the people do not like Gooseneck/syphone component of the waterseal latrine. This supports the findings of literature review. Study showed that most of the people of the study area break the gooseneck or use slab without gooseneck/syphone. Most of the People put forward several reasons in support of their stand. These reasons are:

- *Stool/leaf/waste remain stuck: People complained that due to the presence of gooseneck/syphone stool cannot fall directly in pit and remains stuck within the gooseneck. Besides stool, leaves also remain stuck within it. Installation of latrine without roof behind/under the tree may be responsible for this situation*

- *Need more water for cleaning: The presence of gooseneck demands minimum two to three Badhna water to flush the stool from pan. They argue that it is not easy to ensure that all members of household will come out from the latrine and will enter two to three times again in the latrine to flush the pan after the defecation*
- *Not having easy access to water: Ensuring cleaning of the pan becomes impossible where people do not have easy access to water source.*
- *Difficult to clean: due to the shape of the gooseneck it becomes very difficult to clean. Sometime even the gooseneck falls in the pit during cleaning*
- *Extra money is needed to buy the syphone: Recently most of the latrine production center use plastic pan and they charge extra 15 to 20 taka for syphone. This reflect people's lack of awareness regarding the significance of syphone/gooseneck of waterseal latrine*

The study reveals that several factors are responsible for the present poor sanitation situation in rural Bangladesh. Some of the important factors are affordability, unawareness, not having access to quality latrine components, water access problem, and environmental difficulties. All of these issues cannot be addressed only through the modification of the latrine designs. Some of these might need addressing through the change of WatSan intervention approaches and strategies besides the modification of latrine designs. NGO Forum can promote low cost air seal latrines in the areas where people face water scarcity. Moreover, the water access issue should be considered also for latrine use and maintenance purposes. If possible attempt should be made to ensure water supply inside the latrine. Furthermore, to address the open defecation during working hours in the field, river etc. new coverage approach along with household coverage approach should be considered. In the flash flood and swamp surrounded places where people face space constrains as well as the possibilities of sweeping away of latrine components, due to the current of the water, community latrine with heavy construction can be installed to address the defecation problem.

Apart from these, to address the affordability issue, credit in low interest rate can be provided among the poor. However, the credit amount should include all the expenses relating to installation, transportation, construction of superstructure, procuring latrine structure etc. Organizations working in the WatSan sector should develop partnership with Micro finance organizations to provide WatSan credit in their programme areas. In respect of community services like community latrine, common water points and facilities, WatSan credit can be provided to community people through Union Parishad. Union Parishad would play the role of the guarantor. Besides, the involvement of Micro Finance Organizations, strategy should be drawn out to activate Union Parishad and grassroots level government health workers and volunteers, Anser and VDP to reduce open defecation and use of unhygienic latrine, and destruction of open latrine. Moreover organization should also promote private producer to establish Sanitary Mart. Sanitary Marts will have various types of ready made superstructures, pots that can be used to have water access within the latrine (watertanks/Pot/Containers attached with tap). NGOs will provide credit, designs and training on various types of superstructure and watertanks to the local Mason/potter to run sanitary mart.

Besides these programme strategies and activities, this research recommend for further researches in various areas. The time and financial constraints have restricted the liberty of researcher, which ultimately had imposed some limitation on the virtue of the present research. Number of villages selected for the research is very small. Moreover, FGDs could not be arranged on the basis of socio-economic categories of the participants because all the FGDs' were arranged on spot during the field visit. As a result data analysis on the basis of socio-economic background of the respondents were dropped to avoid wrong interpretations. Therefore to understand the affordability issue of latrine technologies, further research should be undertaken.

Moreover, to understand comparative preference of latrine users an applied research study should be undertaken among the users of all types of latrines promoted by various organizations.

Furthermore, action research should be undertaken to judge the social, financial, technical, and environmental suitability and viability of the air seal latrine in the water scarcity areas and on the facilities that can ensure water access inside the latrine.

Chapter-1
Introduction

In Bangladesh, several Government and non-government organizations have been working for several decades to improve the sanitation situation of the rural areas. *LGED, DPHE, NGO Forum for Drinking Water Supply & Sanitation, BRAC, Proshika MUK, Grameen Bank, CARITAS, World Vision, CCDB, OXFAM, RDRS, Shapla Neer, ASA, Action Aid, VERC, and SAP-Bangladesh,* are the major organisations working in the sanitation sector in rural area of Bangladesh. The principal objective of these organisations has been ***shifting millions from open defecation to hygienic latrine.***

Programme intervention of these organisations has raised the percentage of latrine coverage but still the sanitation condition, as a whole is not satisfactory. Currently, only 41 percent of the rural population have acceptable sanitary systems for hygienic disposal of excreta.[1] Moreover, use of latrine by all household members, and maintenance of hygienic conditions of the latrine of the people of Bangladesh presents further gloomy picture. About 25,000 metric tons of faecal matters end up on public lands and waterways everyday. As a result the coliform count of most surface water resources is beyond the acceptable standard for any domestic use.[2] All these means morbidity, malnutrition and mortality due to *WatSan* related diseases among rural people remain high in Bangladesh. In each year 110,000 children die in Bangladesh in diarrhoeal diseases.[3]

This context invigorates *NGO Forum for Drinking Water Supply and Sanitation* to initiate the present study to identify whether there is any relationship between the designs of sanitary latrine technologies available in the rural area of Bangladesh and the present poor sanitation conditions.

The organisation's prime intent about this study is to initiate an action research on latrine technologies if study findings implicate the need for change or modification of design of it's promoted latrine technologies to address the people's preference and need to ensure safe disposal of human excreta.

NGO Forum
for Drinking Water Supply & Sanitation

NGO Forum, is the apex networking and service delivery agency of NGOs, CBOs and private sector actor who implement water and sanitation programmes for the unserved and underserved communities living in the rural and urban areas of Bangladesh. At present it is involved in partnership with 600 NGOs & CBOs and 299 private producers.

***Mission**: Reducing morbidity and mortality caused by Water and excreta related diseases ensuring safe and affordable sustainable water supply and sanitation services and improvement of hygiene behaviour of the community people*

***Operational Areas**: All 64 districts of Bangladesh. NGO Forum central office delivers its services through its 14 regional offices and training centres*
***Activities and services**: Training, Research, BCC material development, Advocacy, capability build up of partners, Water & sanitation hardware supports. Till now 14.5 million people are directly benefited from these activities of the organization*

Objective(s) of the study:

General Objective: Know the environmental suitability, and people's acceptability of the promoted latrine technologies to enhance effectiveness of the programme intervention

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[1] Progotir Pathey, 2000, BBS & UNICEF
[2] K B Sajjadur Rasheed, "Environmental Governance in Bangladesh," in Contemporary issues in development: Essays in honour of Q K Ahmad, Edited by Asit Biswas, JSA Brichieri-Colombi, Amirul Islam Chowdhury, K B Sajjadur Rasheed,BUP Dhaka, 2002,p- 151
[3] Progotir Pathey, opcit

Specific objectives:

- Examine whether there exist any linkage between design of latrine technologies available in the area and the status of sanitary latrine coverage
- Investigate the possible link between the design of available latrine technologies and the behaviour of the people regarding use & maintenance
- Assess the suitability of the latrine technology with natural environment of the locality
- Know people's preference regarding design of various components of the latrine technologies available in the localities.

Methodology:

- Literature Review
- Field Study

Initially attempt was made to meet the objectives of the study through literature Review. Review of the literature was begun with the preparation of bibliography and literature survey on various types of latrine technologies that ensure safe disposal of human excreta particularly those existing in rural area of Bangladesh. Subsequently published & unpublished materials were gathered for review, to know the people's view about the latrine technologies available in rural Bangladesh. Attempts were also made to collect relevant material available in the Internet. The literature survey was completed within the 15 days starting from 3rd week of September 2002. The review directs to initiate a field study to address the study problem.

Subsequently, field study was planned and commenced to grasp the field facts such as latrine coverage status, types of latrine available in the areas, various socio-economic and environmental difficulties to ensure sanitary latrine coverage and proper maintenance of the sanitary latrine.

Conversational interview, focus group discussion, transects walk and observation methods were followed to gather necessary information.

WatSan field staff, Masons/mistries/latrine producer, Local Doctors/Quacks, local leaders, teachers was interviewed primarily to gather information regarding socio-economic status of the village and villagers, environment and health status, sanitation status, hygiene related behaviour, while focus group discussion was facilitated to know views regarding the use and maintenance of latrine, reasons of having or not having sanitary latrine.

The observation and transect walk was used to apprehend the actual sanitation status to ensure triangulation of the information. Information gathered through field survey was completed in 40 days starting from November 2nd week, 2002. Different semi structured check lists were used for the collection of information.

Study Area:

The environment of an area has a great influence on the life style of the inhabitant and their perceptions. Moreover, it plays an important role in shaping the development strategy of an area. Therefore, for the present kind of study the environmental phenomena need to be given especial consideration in selecting

the study area. The environment of Bangladesh imparts an impression of uniform characteristic but it also has diversity that needs to be noted.

Bangladesh essentially is the land of rivers, brooks, marshes and lakes and most of its lands are exceedingly flat and low-lying. However, 12 percent of its lands located in the northern and eastern areas are hilly and underlain mainly by unconsolidated beds of sandstones, siltstones and shales. Environmentally this area can be categorized as hilly & stony area.

Apart from this hilly & stony area, environmental diversity is also very much distinct in the various parts of the flat land. Considering the environmental difficulties the flatland of Bangladesh can be classified into four environmental categories. These are plain lands, flood affected, flash flood affected, and saline affected area. Thus Bangladesh can be classified environmentally into five categories. Based on these environmental categories, five non-intervened villages of NGO Forum were selected for the study. From each environmental category one village was selected.

Apart from the environmental criteria, the idea of trimming down the travelling time was also considered in selecting the study villages. Villages falling under the plain land, hilly & stony and flash flood affected categories were selected from *Habiganj, Sylhet* and *Sunamganj* district respectively. The flood affected village was selected from *Manikganj* while from the *Satkhira* district saline affected village was selected. Selection of three villages from one division (*Sylhet*) and one village from *Dhaka's* adjacent district (*Manikganj*) had helped in cutting down the travelling time. (See Table 1.1 & the location Map)

Nonetheless, it would have been better to select a village from *Chittagong Hill Tracts* under the hilly & stony category. However, this was not done due to the following factors:

- Selection from CHT would demand study on nearly 14 ethnic communities to bring a relationship with environment, community & latrine design. This cannot be done within the short span of time provided for this present study
- NGO Forum, recently carried out a study in CHT which to some extent takes care of the effect of environment of CHT on latrine coverage (ed, Rizwan A, 2002),
- The political situation of CHT was not very encouraging during the scheduled period of field study
- Demand more time in reaching and undertaking study.

Table: 1.1: Studied Villages and their Location

Village Selection Criteria	Studied village	Union	Thana/Upazila	District
Flood Affected ➡	*Chhoto Bayanah*	*Baliakhora*	*Ghior*	*Manikganj*
Saline Affected ➡	*Chhoto Bhatkhali*	*Munshiganj*	*Shamnagar*	*Satkhira*
Plain land ➡	*Pachgathia*	*Ranigao*	*Chunarughat*	*Habiganj*
Hilly & Stony ➡	*Assampara*	*Jointa*	*Jointa*	*Sylhet*
Flash-Flood Affected ➡	*Dariabaj*	*Molapara*	*Sunamganj Sadar*	*Sunamganj*

Rationale for the field study:

- ***Dearth of relevant Literature***
- ***Absence of recent Literature***

A number of published and unpublished documents on Water & Sanitation were reviewed to gather information on people's view on latrine technologies available in Bangladesh.[4] However, only few documents were found those have some relevancy with the present research problem. Most of these documents are unpublished reports on the project intervention of various organizations.

All of the documents except one are peripheral. Only little information of them is relevant. The single document (DPHE-UNICEF-WHO, Oct 1983) having direct relationship with some of the objectives of the present study is a comparative study of various low cost latrines distributed free of cost among the community people under a pilot project.

The nature of these documents raised difficulties for thematic review. Most of these documents present findings of field survey mostly variable by variable without directing to any specific proposition(s). However still attempts is made to embody a thematic shape in some extent.

Types of Latrine available in Rural Bangla

Various organisations have been working in the sanitation sector for decades in Bangladesh to improve the sanitation status. Taking into account the economic conditions and the culture of water use for anal cleansing, these organisations have been promoting several types of low cost latrines.

Most of the leading organisations starting from *DPHE, NGO Forum, Caritas, VERC, BRAC, Grameen bank, and ASA* offer mostly the same types of low cost latrine technologies. These latrine options are Water-seal direct pit latrine, Home-made direct pit latrines, Off-set pit latrine, Water-seal Burnt-clay latrine, and Water-seal pit latrine with different types of gooseneck/syphone, Twin pit latrine (NGO Forum, 1998[5]; VERC, 2002[6]). However, among all of these options, these organisations put more emphasis on the promotion of water-seal direct & offset pit latrines. The design of these latrines promoted by all organisations is the same except with some variation in the design of syphone/Gooseneck. The availability of various latrine designs and technologies do not ensure the existence of all of them in the community level.

In the mid 1990s an attempt was made to document the types of latrine available in the rural area of Bangladesh (DPHE & UNICEF, 1995)[7]. The study revealed the existence of two types of pit latrine and three types of waterseal latrine. These latrine technologies are Home-made (Do it-Yourself) latrines, simple pit without lining, water-seal Latrine with RCC rings, water-seal latrine with burnt-clay-rings and Twin pit water seal latrine.

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[4] For literature review, Unicef (Dhaka), ICDDR, B, BRAC, NRC-NGO Forum, libraries were surveyed. Besides these libraries, VERC, Proshika-MUK organizations were visited to collected relevant documents.

[5] NGO Forum, "Searching for a Common Strategy for Cost Sharing in sanitation Programme," Work shop report, unpublished, Dhaka, 1998

[6] VERC, "Shifting Millions from Open Defecation to Hygienic Latrines," VERC, Savar, 2002

[7] DPHE & UNICEF, " Documentation of Various latrine Technologies in Rural Bangladesh," unpublished, Dhaka, 1995

A recent survey conducted in the 58 districts of Bangladesh (Avizit Reaz Quazi, March 2002) confirmed the existence of similar types of latrine. However both of these surveys do not present any facts and findings that indicate the people's preference about latrine technology.

People prefer Waterseal latrine than other low cost latrine technologies:

To knowing the people's view about technological alternatives and preference is very much necessary for making sanitation programme more successful. In the early eighties a study (DPHE-UNICEF-WHO, 1983)[8] was conducted on 5 types of low cost latrine technologies to know the views and preference of the users who had received latrines free of cost. The investigated latrine technologies were International Voluntary Service (IVS), Ventilated Improved Pit (VIP), Vietnamese (Viet), Waterseal latrine and Improved Pit (IP). The opinions expressed by the villagers about latrines were conditioned mainly by the following factors: smell, durability of the materials, safety for children, backsplash from the latrine, privacy and convenience.

Improved Pit and Water seal varieties of latrine were perceived as being satisfactory. In contrast, the villagers had varying degrees of dissatisfaction with the other types of tested latrines. IVS type was the least preferred one. Some reasons mentioned were its lack of durability, lack of safety, smell and backsplash from falling excreta. The Vietnamese variety was perceived as too costly. Moreover users did not see any advantage of this over the WS &IP. Villagers expressed very poor opinion about VIP latrines because it smelled, splashed and the defecation hole is too big to be considered as safe for children to use.

Thus the study shows people's preference for Water seal latrine over other types of low cost sanitary latrine technologies. However, few studies implicate some difficulties people face with the Water seal latrine.

People's difficulties with the Waterseal Latrine:

Studies show that people have some difficulties with water seal latrine with respect to affordability, use & maintenance.

When people were asked about the cause of not using the waterseal latrine, majority of the people who do not have Water seal latrine mentioned financial condition as the reason for not having WSL (M Fazlul haq, Nargis Jahan & Alauddin 1997[9] ; DPHE-UNICEF & VHSS, 1995[10];). A similar findings was also reported in a recent survey (Avizit Reaz Quazi, March 2002)[11]. According to the survey, 55% households are not able to use hygienic latrine due to lack of finance. Besides affordability, waterseal latrine also have problem in installation and use & maintenance.

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[8] DPHE-UNICEF-WHO, "Evaluation of Latrine Technology (Volume II): User Perceptions and observed Use of Latrines in Rahamaterpara," unpublished, Dhaka 1983

[9] M. Fazlul haq, Nargis Jahan, H. M. Alauddin, "Sanitation Coverage: A study in Four Villages of Rajshahi Division", Rural Development Academy, Bogra, 1997

[10] DPHE-UNICEF & VHSS, "Women in the context of sanitation, water supply and hygiene: A village based study," Unpublished Dhaka, 1995

[11] Avizit Reaz Quazi, "The Water Supply & sanitation Situation in Rural Bangladesh: The case of the villages selected for the 2002-2003 WatSan programme of NGO Forum," NGO Forum for DWSS, Dhaka, 2002

A considerable number of people find difficulties with the Gooseneck/ Syphone. They break up the gooseneck as they found it responsible for blocking of excreta and excess water requirement for cleaning (Alauddin H. M., 1997; [12] A.K. Sharifullah, 1996[13]; Unicef & DPHE, 1980[14]). Not having easy access to water source is largely responsible for it. *Malik Gazi* a resident of a coastal village *Koyra,* in *Khulna* commented, " In dry season all kinds of available water sources dry up, we are not even able to collect enough water for drinking purposes then where from we will get the huge amount of water required in latrine that have water seal. If we keep the waterseal intact then we have to hire labour to carry water from far distance to clean up the latrine. Will you pay for it" (Avizit Reaz Quazi, July 2002)[15].

People also face other types of problems that restrict the use of water seal latrine with RCC ring & slab. In the hilly area the huge weight of the rings and slab raise mobility problem. It is very difficult to carry latrine components from VSC situated in the low land area to the hilltops where the people reside (Rizwan Ahmed, July 2002).[16] In the saline affected area longevity of the ring and slab get reduced due to saline environment (Avizit Reaz Quazi July 2002).

Besides longevity, various types of pan used in waterseal latrines raise difficulties in maintenance (UNICEF-MIDAS 1983)[17]. The problem with concrete pan is that If sufficient cement glaze is not provided, the surface of the latrine pans become rough and slowly, which make the cleaning of the pan difficult while use of plastic pan raise another types of problem. In India fibre glass and plastic were used to make the pans. However, this did not prove to be very successful because, in course of time, the plastic cannot combat the acidity of excrements and urine. It loses its slippery effect and yellow stains develop gradually on the surface. As an alternative option CARITAS has come up with an innovative approach. They have demonstrated that only a change in the materials from cement, bricks, etc., to clay will bring about a substantial improvement in enhancing the programme impacts. However, Caritas model also suffer from a few basic problems. Firstly the glaze that is applied on pan is prepared from red clay, khair, etc is weak. This glaze after a few months gets washed away. Consequently the same problem usually faced by cement pans occurs. Organic materials start gathering on the pan surface. Moreover, it loses its structural integrity and also the durability no longer assured. Nevertheless, if biscuit firing and glaze firing processes are followed to produce clay pans problems of the CARITAS model can be solved (UNICEF-MIDAS1983).

Apart from these problems users of water-seal latrine pointed out to another problem regarding the existing design of the slab. User's argued that the existing location of the footrest raises problem for children to squat (DPHE-UNICEF-WHO, 1983).

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[12] H. M. Alauddin, " Use of Water Sealed Latrine: A Study on the Experiences of Juanpur Village", Rural Development Academy, Bogra, 1997

[13] A. K. Sharifullah, Abdus Samad Miah, Md. Abdul Quddus, "A Comparative Study on Sanitation Situation and Impact of Different Approaches for Improvement of Sanitation Coverage in Comilla," BARD, Comilla & UNICEF, Unpublished, 1996

[14] UNICEF & DPHE, " Enduse Evaluation of Waterseal latrines: Nine Village Profile of Kaliakoir in Bangladesh," preliminary report, 1980, unpublished

[15] Avizit Reaz Quazi, "People's perception on Water and sanitation programme of various Government and Non Government Organizations: The case of Coastal Belt," NGO Forum for DWSS, (Unpublished), Dhaka, 2002

[16] Rizwan Ahmed, (edited) "People's perception on Water and sanitation programme of various Government and Non Government Organizations: The case of Chittagong Hill Tracts and Chittagong coastal areas," NGO Forum for DWSS, (Unpublished), Dhaka, 2002

[17] UNICEF & MIDAS, "Improvement possibilities of Clay Latrine Systems," Dhaka, 1983

The review of the documents implicates the presence of very little information on the present research problem. Moreover the information illustrated in these documents is not based on the recent field studies. Furthermore, all the environmental diversities of Bangladesh that might have impact on the latrine coverage are not addressed. Only salinity issue and hilly environment were covered but that also is not in comprehensive and analytical ways.

This dearth of relevant information based on the recent field findings leave no ways but to undertake a field study to meet the study objectives.

Constraints & Limitation of the study:

The field facts do not provide any opportunity to gather people's view on all types of low cost sanitary latrine technologies illustrated in various documents of organisations working in the sanitation sector. During field survey, several types of water seal latrines and pit latrines were found. Nevertheless, it does not limit the importance of the study because the objective of the research was not to study on all technologies and designs of latrines documented in the various books but to know people's view on latrine technologies, which they can have access.

However, the time available for the study causes some limitations for the study. 15 days for literature review is too small. Moreover, not having easy access to libraries and Internet facilities have further reduced the reviewing time in actual sense. Nevertheless, the attempt has been made to overcome the problem in the qualitative sense by narrowing down the focus of the review only to assess people's perceptions on low cost latrine technologies available in Bangladesh.

Time constraints along with financial limitation also restricted the opportunity for detailed field study. Given the available time and limited money the field study was restricted to one village from each environmental category. This limits generalisation of the findings that might in fact be unique for that specific locality. Moreover, FGDs could not arranged on the basis of socio-economic categories of the participants because all the FGDs' were arranged on spot during the field visit. As a result data analyses on the basis of socio-economic background of the respondents were drop to avoid wrong interpretations.

Apart from above constraint, the military operation in the entire country at the time of the field study also created problems. People showed their initial suspiciousness over the intention of group discussion and interview by the researchers who are basically outsiders for them. However, the involvement of field staff of the organisation working in the locality and explanation of the purpose of the study helped to overcome this initial suspicion.

Data Collection and Analysis:

NGO Forum's research experts, regional personnel and PNGO staff, who have enough idea about the study areas were involved in data collection to ensure the quality of the data. The discussions and interviews with the respondents were documented in the field note as well as audio documentation was ensured. In the analysis of the data besides qualitative explanation attempt are made to present quantitative analysis of some of the variables.

Chapter-II
Introducing the study area

Environment

Studied villages were selected on the basis of environmental criteria to apprehend the effect of environmental diversity on the sanitation situation in Bangladesh. One village was selected from each of the five environmental categories. These villages are *Chhoto Bainnyah, Pachgathia, Dariabaj, Assampara* and *Chhoto Bhatkhali.*

Chhoto Bainnyah village environmentally fall under the flood-affected area. It is situated in the *Ghior Upazila* of *Manikganj* district. Each year, during rainy season, the floodwater submerges major portion of the village. *Khirai* River that divides the village from *Pukuria* village is mainly responsible for the regular flooding of the area. Residents, to minimise the affect of regular flooding raise their homestead eight to ten feet from the ground through earth filling. This involves extra expenditure, labour and time. Moreover, after each flood people have to ensure earth filling of the homestead to repair the erosion caused by the floodwater. Due to these reasons, people of this village cannot possess homestead with extent which dwellers leaving in the plain land area of Bangladesh can. As a result people face space constraints to build any thing including latrine within homestead. Besides space constraints, the soil of the area also raises difficulties for latrine installation. The soil is a mixture of sandy & loamy earth and not suitable for simple pit latrine. Suffering of the inhabitants is further increased by the difficulties in accessing drinking water. Geo-hydrologically, the village falls under the low water table area. Furthermore, water available from most of the shallow tubewells of the area have unacceptable level of arsenic contamination and also is not free from iron contamination.

The ***Pachgathia*** village environmentally fall under the plain land category. It is situated in *Chunarughat Upazila* of *Habiganj* and environmentally in many ways different from *Chhoto Bainnyah.* However, the soil of the village is nearly same as *Chhoto Bainnyah.* It is soft and sandy and not very suitable for installation of simple pit latrine. The village is mostly free from flood. Nonetheless, at times some portions in the east and west sides of the village get flooded. Geo-hydrologically, the village belongs to the shallow water table area. The arsenic contamination of tubewell water is not yet been reported. However, water is highly contaminated with iron. Moreover some of the tubewells' water contains foul odour.

Daraibaj village is situated in the *Sadar Upazila of Sunamganj* district. It is a flash flood affected village. Moreover, during wet monsoon period as the water of the nearby swamp called *Dakhar Hawar* gets augmented the entire village goes under water and becomes the part of the swamp. However, a small portion of the village, which inhabitants have raised with earth filling mostly remains free from swamp water. This earthwork is half a mile long and the height vary from 5 to 7 feet while the breadth vary from 15 to 50 feet. All the residents of the village have build their homestead on the limited space available on the raised portion. As a result there remain hardly any distance between residences and the entire portion looks like an urban slum. The soil of the area is

hard yet the area is not friendly for instillation for low cost sanitary latrine. In the rainy season the village faces twin problems. Besides the continuous erosion of the earthwork by waves of the swamp, the flashed flood come from the nearby Indian hills devastates homesteads in regular interval. The issue of access to safe water also became difficult due to the existence of unacceptable level of iron and arsenic contamination of water available from some of the tubewell. However, the village is not facing the problem of lowering of water table beyond the suction limit and Geo-hydrologically belongs to the shallow water table.

In contrast to *Dariabaj* the entire area of ***Assam para*** is full of small hills. People live in small cluster on the hilltops. The Assampara village is situated at Jointa Upazila in Sylhet district. Geo-hydrologically the area, fall under the hilly & stony area. The ground of the area is very hard due to the presence of stone. As a result one ring is enough for installation of any waterseal type latrine. However, the impervious nature of the ground is responsible for the quick fill up of latrine pit raises difficulties in using waterseal latrine. The use of waterseal latrine becomes further complicated due to not having easy access to water sources. The area does not have any hill stream, which is a feature of hilly area of Chittagong hill tracts. The nearest river is one and half Km away from the village. The few ringwells and wells available in the area are the only sources of water.

The ***Chhoto Bhatkhali,*** which is located in *Satkhira* district, presents another diverse environmental phenomena of Bangladesh. It is a saline affected village. In the recent years the salinity of the area is increased tremendously due to the extensive shrimp cultivation. *Sundarbans* is only two km away from the village. Occasionally the area hits by cyclone and tidal bore. The inhabitants of the area do not live scattered way in the entire village in small cluster and have built their residences on the bank of the canal that divided the village from the Baro Bhatkhali and Jatindra nagar village (popularly known as *Sundarbans* village). Distance between residences is very less and the population density of residential portion of the village is very high. The soil of the area is clayey. This clayey nature of the soil has made an impact on the lifestyle of the villgers. A considerable percentage of residents have built their houses, and boundary walls of the homestead along with artistic entrance gate with clay.

Status of the basic facilities

Communication infrastructure, health and educational services, power supply besides water & sanitation facilities are some of the prerequisite facilities that are very much necessary for the overall development of an area and its people. However, all the studied villages lack these facilities.

With regard to communication facilities, ***Dariabaj*** presents the gloomiest picture. All sorts of roads are absent. Usually, boat remains the only means of communication. However during the dry monsoon period, some portion of the swamp get elevated due to the receding of water. People use this elevated land as pathway during dry monsoon period. The nearest *pacca* road is 5 km away from the village.

Like the communication facilities the village also lacks health and educational facilities. The village has only one non-formal school and the nearest primary school is one and half km away from the village. Health facilities are also not available in the village or in its nearby area. However, two quacks locally known as *Palli Chikitsock* are available in the *Echa Gori Shaniganj Bazar*, which is

two km away from it. Villagers during serious illness visit *Shunamganj Sadar Haspatal* . The distance between the village and hospital is 15 km. Villagers, regarding power supply facility some extent are fortunate. Electricity has reached in west portion of the village. For the worshipping purposes a Mosque is available there.

The condition of *Assampara* is slightly better than *Dariabaj.* The *Sylhet-Zaflong* highway has gone through the village but lacks roads for internal communication. The village also lacks health facilities. There is only one quack available in the village. The nearest hospital is situated in *Jointa upazila*, 5 km away from the village. The distance between the nearest primary school and village is 2 km. Nevertheless, inhabitants of *Assampara* enjoy the electricity supply facility. They also have enough worshipping facilities. Three Mosques are situated in the village.

The *Chhoto Bhatkhali* also presents almost same scenario. The village has mud road but are not well maintained. Herringbone road, which passes by the side of the village, connects *Jotindra Nagar* village with *Munshiganj* main road. Village quacks are available in *Jotindra Nagar*, which is 2 km away from the village. The distance between the village and *Upazila health complex* is 20 km. One Mosque and a primary school are available in the area.

Pachgathia enjoys better facilities than above mentioned villages. Some of its internal roads are made of Herringbone and some portions are made of mud. Three non-formal (NGO School) and one non-government registered school are available in the area. In addition, it has three Masques, three *Mactabs* and one *Madrassa.* The Community clinic is 1 and half Km, away from the village. Besides that three Quacks are available in the *Mirashi Natun bazaar* which is 1and half KM away from the village. The Upazila health complex is situated in *Chunarughat* town, three and half km away from the village

In spite of being its proximity to *Dhaka*, ***Chhoto Bainnyah*** lacks basic facilities. Only a portion of the village has proper road that also made of mud. Moreover, a traditional bridge made of a single bamboo had been the only way of communication through which villagers used to maintain contact relation with the main land. However, recently the situation has improved with the completion of a concrete bridge on *Khirai* River. Apart from communication facilities, the village lacks adequate health facilities. Community clinic is not available in the village but in the union. One quack doctor is available in *Pukuria Bus stand,* one km away from the village. The nearest hospital is situated in Manikganj Sadar. The distance is 20 km from the village. However, the village enjoys better educational facilities. One primary school and one high school are situated in village. The village also enjoys worshipping facilities. Two Mosques and one *Mandir* are available in the area.

NGO activities:

Several NGO's are active in the studied villages. However, their activities are mostly remained confined within the credit and savings program.[1] In *Pachgathia* and *Dariabaj* village NGOs besides credit scheme have been carrying out non-formal education programme. It was frustrating for the researchers to notice the fact that in the studied villages not even a single organization is carrying out independent *WatSan* programme. Nevertheless, some NGO's have attempted to address the sanitation issue through associating latrine installation issue with their credit scheme.

[1] In Chhoto Bhatkhali villagers expressed strong resentment against the credit programme of a leading national NGO

Table: 2.1: Activities of the NGO's operating in the study villages

Villages	NGOs	Type of program	Remark on *WatSan* activities
Chhoto Bainnyah	SIDA: Leading Organisation	Credit Sanitation	Have attached sanitation programme with its credit program. If any one take credit five thousands the individual will have to take one thousand more for latrine installation.
	Brac	At present inactive	--
	Proshika	One non active *Samiti*	--
Chhoto Bhatkhali	Caritas: Leading Organisation	Credit, Environment, Plantation, *WatSan*	Distribute water seal (3 ring & slab with plastic pan) latrine in subsidized price among its *samiti* members. Each year small number of members receive this support. Recently dug a pond for drinking purposes
	Shusilon	Legal Aid	--
	Progoti	Awareness & Credit	--
	BRAC	Credit	--
Pachgathia	Brac: Leading Org	Credit &NFPE	At present not a single organization have any *WatSan* programme. However, 3-4 years before NGO Forum for DWSS distributed few latrine & TW under Rehabilitation programme
	SABA	Credit & NFPE	
	ASA	Credit	
	PASA	Credit	
Assampara	Grameen Bank: Leading Org	Credit	No *WatSan* programme
	BRAC	Credit	
	JASIS	Credit	
Dariabaj	BRAC	Credit	--
	ASD	Credit	Each year small number of its member receive credit for latrine installation

Demography of the study area

Ethnically, the entire population of the studied villages is Bangali. Religiously 100% residents of *Dariabaj, Chhoto Bhatkhali* village are Muslim. However, presence of considerable percentage of Hindu population and tiny percentage of *Rajbanshi* and *Dhibor* community people in the adjacent *Baro Bhatkhali* village some time raises confusion about the distribution of population in *Chhoto Bhatkhali.*

The *Chhoto Bainnyah, Pachgathia* and *Assampara* village do not share the homogenous feature of *Dariabaj* and Chhoto Bhakhali villages. 95%, 70% and 98% people in *Chhoto Bainnyah, Pachgathia* and *Assampara* are Muslim respectively and the rest are Hindus.

Table: 2.2: population of the study area (approximately)

Village	Household	HH Size	Population		Community wise population percentage		
			Total	Physically Disable	Muslim	Hindu	Other
Chhoto Bainnyah	170	4.1	700	5	95	05	00
Chhoto Bhatkhali	350	5.71	2000	02	100	00	00
Pachgathia	275	4.7	1300	07	70	30	00
Assampara	240	4.6	1100	11	98	2	00
Dariabaj	175	6.9	1200	00	100	00	00

Types of economic activities and earning sources of the villagers:

Environmental conditions and natural resources available in the area have determined the economic activities of the inhabitants particularly living *Dariabaj*, *Assampara* and *Chhoto Bhatkhali*. The people of *Dariabaj* have taken the advantage of being part of *Dakhar Hawor* (swamp). Majority people have chosen fishing as their profession. In *Assampara* majority people have recognized the economic opportunity created in the area due to the existence of natural stone in nearby Jaflong area. Most of the people of *Assampara* village have engaged themselves in stone collection related activity. In *Chhoto Bhatkhali* , people taking the advantage of salinity of the area are involved in activities related to shrimp cultivation.

In *Dariabaj*, 55%, 5%, 20% and 15% households' earn through fishing, fish related business, paddy cultivation and day labour activities respectively. The environment of the area does not permit cultivation of land more than once in a year because lands remain submerged during wet monsoon period. During wet monsoon period, most of the paddy cultivators and day labourer due to the absence of cultivation opportunity and the presence of alternative financially profitable opportunity respectively, adopt fish related activities as earning source. However, they do not want to disclose this fact to the outsider because the neighbouring villagers consider the fishing activity as socially degrading one. In *Dariabaj* 60% households earns per month, less than one thousand *taka* only, while 8% earn between 2000 to 3000 *taka.* Only 2% households able to earn more than three thousands and the rest earn between 1000-2000 thousands.

In *Assampara*, most of the people are daily labourer and involved in stone gathering and loading the truck with stone in the neighbouring *Joflong* area. Each individual earns at least one hundred *taka* a day. This easy earning opportunity has seriously affected the attitude of the people of the area. They send their family members including children having age around eight years to *Joflong* to gather stone instead of school.

Nearly 60% population are involved in stone gathering and 15% in stone-related business. The rest are engaged in cultivation, service, truck driving and stone-related business. In comparison to other rural areas of Bangladesh residents of the *Assampara* are rich. Nearly 60 % households earn more than three thousand *taka* in a month. Only a few percentages of households (8%) earn between 1000-2000 *taka*, monthly. The rest earn between 2000-3000 *taka.*

In *Chhoto Bhatkhali*, 20%, 20%, 10%, and 25% households are involved in shrimp cultivation, fishing and catching fish fry, fish business, and working as shrimp farm labourer, respectively. Availability of shrimp fish fry in the nearby river is working as a safety net for the poor people of the area. In absence of any other economic opportunity, a person can earn 70 to 80 taka a day, only through catching and selling shrimp fish fry. However, this is very risky activity due to the river's proximity to *Sundarbans.* In *Chhoto Bhatkhali* 60% households, earn between 1000-2000 *taka* while 25% earn between 2000-3000 *taka*, monthly. The rest earn more than 3000 *taka* ,monthly.

In *Pachgathia* agriculture is the main earning source for 55 % households. The rest earn through day labouring, services and business. Availability of cane, bamboo, firewood in the nearby hills provides the safety net for the landless and day labourers of the area. In absence any other job,

people can earn minimum 50 *taka* a day through collecting cane, bamboo, and firewood from hills and selling in the market.
In *Pachgathia* 15% households' monthly earning is more than three thousand *taka* while 5% households' monthly earning is less than 1000. However, monthly earning of the majority people (60%) is between 1000 to 2000 *taka*. The rest earn between 2000 to 3000 *taka* per month.

In *Chhoto Bainnyah* majority households earn through agricultural activities (60%) and daily labouring (20%). The rest earn through business, service and rickshaw pulling, driving *tampu* etc. Nearly 40% people's monthly earning is less than one thousand *taka*. 20% households earn between 1000-2000 *taka*, 10% between 2000-3000 *taka* and the rest earn more than 3000 *taka*.

Table:2.3 Principal Earning source wise Household percentage (approximately)

Village	Agriculture	Shrimp/ Fish farming	Fishing	Daily labour			Business			Service	Other
				At Fish farm	Stone gathering	Other type of labour	Fish related	Stone related	Other small business		
Chhoto Bainnyah	60		--	--	--	20		--	8	7	5
Chhoto Bhatkhali	10	20	20	25	--	8	10	--	1	1	4
Pachgathia	55		--	--	--	30	--	--	5	5	5
Assampara	10		--	--	60		--	15	2	3	10
Dariabaj	20		55	--	--	15	5	--	2	2	1

Source: FGD findings

Table:2.4: Income wise household percentage: (approximately)

Village	Less than 1000	1000-2000	2000-3000	3000>
Chhoto Bainnyah	40	20	10	30
Chhoto Bhatkhali	00	60	25	15
Pachgathia	5	60	20	15
Assampara	00	8	32	60
Dariabaj	60	30	8	2

Educational Background:

It was revealed in the group discussions with the community people in *Dariabaj*, *Chhoto Bhatkhali*, *Pachgathia* and Assam para that existence of opportunity to earn through unskilled activities has severely affected the educational status of the area. Poor people who can earn through fishing, gather and collecting stone, hill resources and catching shrimp fish fry are motivated to involve their children in economic activities instead of sending them to school and collages. In contrast the existence of NGO activities have played significant role in reducing illiteracy of female population. A considerable portion of female population being the members of NGOs has learned to write their name. (see table: 2.5)

Table: 2.5: Educational status of the population in percentage (approximately)

	Illiterate	can sign only	1 –5th standard	6th to 10th standard	SSC	HSC	Graduation and onward
Chhoto Bainnyah	13	63.6	4.5	9.8	6.8	0.8	1.5
Chhoto Bhatkhali	32.1	17.1	28.3	19.8	2.7		
Pachgathia	32.3	38.7	5.6	6.5	12.1	2.4	2.4
Assampara	27.7	30.7	33.2	5	1.3	1.3	0.8
Dariabaj	73.4	10.7	13.3	1.3	1.3		

Source: The information regarding SSC on wards were collected through FGD and interview with the key informants while other categories information were analysed through triangulation of information among with the information gathered about the participants of FGD, households information collected during observation, FGD findings and findings informants interview

WatSan Knowledge:

Majority people of the study area know that drinking of water from sources other than TW/Pump/plant is responsible for diarrhoeal diseases. However, very few could draw relationship between unhygienic defecation practices and diarrhoeal diseases. Nevertheless, when prompted, few people mentioned about diarrhoea and warm related diseases.

Interestingly, a considerable percentage of people living in *Pachgathia*, *Chhoto Bainnyah* and *Dariabaj* are aware about arsenic contamination issue. Knowing the professional background of the researchers villagers raise several queries about arsenic issue. However, some of them have wrong understanding about the whole arsenic issue. People become aware on arsenic issue during the scanning of shallow tubewells of the area by government agencies and NGOs.

In contrast, villages where shallow tubewells are not available the awareness level of the people regarding arsenic issue is very less. In *Assampara* and *Chhoto Bhatkhali* village majority people haven't heard about it.

Table:2.6: WatSan Knowledge level (percentage of the respondent)

Village	Diseases occur due to drinking/using unsafe water					Diseases occur due to unhygienic behaviour			Heard about arsenic contamination
	Diarrhoea	Dysentery	Jaundice	Skin disease	Could not name any one	Diarrhoea	Worm	Could not mentioned anything	
Chhoto Bainnyah	95	10	30	40	5	10	30	78	100
Chhoto Bhatkhali	90	00	15	00	10	00	15	90	30
Pachgathia	80	00	25	15	20	08	25	70	70
Assampara	70	00	25	00		00	02	98	20
Dariabaj	98	00	00	00		15	02	85	83

General Health problem:

Besides fever and cold & cough problem, inhabitants of study villages experience Gastric, skin diseases like itching & scabies, and diarrhoeal diseases. Diarrhoea is a regular phenomenon of *Dariabaj* and *Pachgathia* village. Majority households, means more than 50 % households, of *Dariabaj* and *Pachgathia* village experienced diarrhoeal diseases within a month prior to the field survey. During this period even two under five children had died due to diarrhoeal attack. The rest study villages also are not free from diarrhoeal diseases but morbidity is much lesser than *Dariabaj* and *Pachgathia* villages. However, it is very astonishing to find that morbidity due to diarrhoea in *Chhoto Bhatkhali* is lesser than *Dariabaj* even though not a single tw/pump/plant available in the village. It is known through the group discussion and interview with key informants that less than one-third households in *Chhoto Bhatkhali* have experienced diarrhoea within a month prior to field survey.

WatSan related general information:

Health problem like diarrhoeal and skin diseases can be reduced through hygienic practices like drinking water from safe sources, proper hand washing before meals and after defecation etc. The study findings present encouraging situation regarding drinking water habit while habit related to water use for other domestic purposes and hand washing presents very dismal scenario.

Residents of study villages use water from four types of technologies (TW/Pump/Plant) available in the area besides traditional sources like traditional well, pond and swamp. Majority people of *Chhoto Bainnyah*, *Pachgathia* and *Dariabaj* collect drinking water from available Tubewells[2]. However, the revelation of unacceptable level of arsenic contamination in the most of the Shallow TW in *Chhoto Bainnyah* and in the considerable number of tubewells in *Dariabaj* has raised serious difficulties in accessing safe drinking water in these areas. It is very important to note that a considerable number of people of *Dariabaj* also collect drinking water from the nearby swamp. In *Assampara* majority households collect drinking water from Ring-wells. However a considerable number of people collect from traditional wells.

In respect of availability of safe water source, *Chhoto Bhatkhali* presents the most dismal picture. Not a single tw/pump/plant available in the villages. Villagers collect water from a PSF[3] and a pond located in the neighbouring village. It is very encouraging to find that majority households of study villages keep their water pot clean and covered.

Table:2.7: Number of TW/pump/plant and traditional water sources available in the study area (approximately)

Village	STW	Deep tw	Ring well	PSF	Reserved Pond	Other/well
Chhoto Bainnyah	90	01	00	00	00	00
Chhoto Bhatkhali	00	00	00	00	01*	00
Pachgathia	27	00	00	00	00	00
Assampara	00	00	07	00	00	05
Dariabaj	07	00	00	00	00	00

* Recently Caritas has dug a pond in the village but not yet in usable condition

[2] In Dariabaj Tubewell is locally called as *Machine*

[3] PSF locally known is *Gudam Filter* (Storage Filter). The PSF is located in 2 km away from the village

People's habit regarding water use for cooking in a big way differs from the drinking habit. Majority people of all the study villages except *Assampara* use pond/river/swamp water for cooking purposes. The reason mentioned for this behaviour is the presence of iron in the tubewell water which change the colour and taste of rice.

The findings on hand washing practices before meal and after defecation shows further unhygienic behaviour of people. It is known through group discussion and interview with key informant that only a marginal number of people wash both hands with soap before taking meal and after defecation. Most of the people wash only one hand with water. Even a considerable percentage of people do not wash hand separately after the anal cleansing.

However, this unhygienic behaviour can be simply explained by saying that people are habituated with these practices due to their unawareness only. However, an in depth analysis of the area would implicates that environmental difficulties in a big way responsible for this situation also.

Chapter-III

Sanitation Status And Impediments toward sanitary latrine coverage

The present situation of the rural area of Bangladesh implicates uneven success in *WatSan* sector. Available information explicitly implies that rural people's access to sanitary latrine is much lesser than the access to TW/Pump/Plant. Decades of programme intervention of international and national organizations could not raise the sanitary latrine coverage up to a desired level. This situation demands the exploration of the factors that are responsible for this undesirable level of latrine coverage in rural Bangladesh. The present study has been undertaken to find out whether design of the latrine technologies available in the locality is responsible for this situation or not.

In this section, findings on defecation practice, current sanitary latrine coverage, latrine condition and peoples' opinion regarding the latrine use, latrine design are discussed sequentially to provide directive analytical conclusion.

Defecation practice:

Study findings indicate that the open defecation has significantly reduced in recent time. Most of the adult people of the study villages use some form of latrine for defecation purposes. This development is the result of social awareness, growth of population density and diminution of desolate places due to change in socio-economic activities and situation.

Chhoto Bhatkhali village present a perfect example of how diminution of desolate places has restricted open defecation. Residents informed that earlier a considerable percentage of people used to practice open defecation. However, the privacy needed for open defecation has totally withered away due to the extension of shrimp farming in the area. Watchmen of shrimp farms to stop steeling of fish, chase those who come near to land including persons attempt to defecate in the open field. *In the word of Ashakur Rahman* of *Chhoto Bhatkhali, "Agey Onekey Khola Jaigaih Paikhana Korto, Akhon ar ta paray Na. Jomitay boshlaee Gharer Paharadarrah Taray Ahshay."* Most of the participants of group discussion share this view but many of them like *Moshtofa Kamal* feels that low cost ring slab latrine introduced by the NGOs have also played an important role in reducing open defecation.

However, it does not mean that entire adult people always use latrine for defecation. Findings indicate that small number of adult people of study the villages, who are mostly male, practice open defecation usually during working hours. More adult persons in *Dariabaj, Assampara* and *Pachgathia* practices open defecation compared to the other study villages. It was also known that in *Pachgathia* open defecation increases during dry season (November-March).

In contrast to adult population, entire under five population, with some exception, practices open defecation. They generally defecate in the courtyard or in the open field close to their homestead. In group

discussion, participants put forwarded an impression that they do not see any thing wrong in the practice of open defecation by under five children.

Why open defecation:

According to the field findings small number of adults in all the study villages except *Chhoto Bainnyah* and most of the children of all study villages are habituated with open defecation. In-depth analysis of field the data indicate the following factors:

Factors responsible for open defecation by adults and under five children:

- Most of the time a major section of the adult population remains busy in working in an area where latrines are not generally available. For instance, shrimp farm workers in *Chhoto Bhatkhali*, stone collectors of *Assampara*, fishermen of *Dariabaj*, farmers of *Pachgathia & Chhoto Bainnyah* mostly remain working in an area where latrines are generally not available. Open defecation during working hours can not be addressed by household based latrine coverage
- Latrines, which households can afford, are not convenient, comfortable and pleasant ones. These conditions generally provide enough reasons to drive people away from latrine. Nevertheless most of the adults but not all, use latrines as it provide privacy compared to open defecation. However, a small number of people still practice open defecation ensuring some form of privacy through using the advantage of darkness, existence of bushes and places like riverbank and crop field where movement of people is less.
- Caring attitude of the parents to a large extent is responsible for open defecation by their children. Parents encourage children to defecate in open places from where they can keep an eye on their children. They perceive latrine as unsafe for children and envisage the possibility of accident[1]
- Children fear to defecate in a place from where they cannot see any one, whom, they can rely. Therefore, they prefer to defecate in an open place from where visual contact with their intimate ones is possible[2]
- Absence of latrines and they are not in a position to access it
- Sudden raise of family dispute among the households who share latrine sometime drive the family members for open defecation for an temporary period
- Finally, lack of awareness among the people that open defecation accelerate health risk

Why people use Latrine for defecation

Findings reveal that people use latrines for several purposes. These include privacy, cleanliness, convenience, social status, and health. Not even a single person had mentioned about security consideration. All the respondents mentioned that they use latrine primarily to maintain privacy[3] and cleanliness. The health and social status along with these issues were considered by only a few respondents.

Nevertheless when they were asked to prioritise the reasons almost all of them put privacy on the top. Cleanliness was given second place by most of the respondents. Over the third place people initially

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[1] *Maskura Begum* of *Dariabaj*, mother of two children first disclosed this observation which later on supported by other female participants

[2] ibid

[3] People used local terms like, *Abru, Pardha, Lajja Sharam* etc.

showed confused stage of mind to arrive in a decision. Convenience/comfort, Cleanliness, Social status, and health were put in the third place. However, the majority's position was in favour of Convenience and Social status.

Initially very few people mentioned about the health issue. However, when a tiny number of respondents highlighted the health issue in particular group discussion all of the participants immediately recognized the significance of health consideration. Nevertheless, most of the people designated health issue with fourth position.

Type of Latrine People Use

The study findings shows that most of the adult population use latrine for defecation purposes. That does not mean every body uses same type of latrine. Respondents mentioned about *Kacha, Pucca* and *Chaka/* Ring-slab latrine. It seems that people generally categorise latrine on the basis of outer looks where superstructure enjoy the prime consideration. People consider all pit, open and hanging latrines that have superstructure made of Bamboo, Wood, Jute stick or various types of leave and plastic sheets as *Kacha* while all types of latrines having brick superstructure are called as *pucca.* Interestingly in respect of *Chaka* latrine/ Ring-slab latrine shows dilemma over categorizing. When the Chaka/Ring Slab latrine has brick superstructure people prefer to call it *pucca* latrine while in other situation they call it *Chaka/*Ring-slab latrines.

However, discussion on the components and nature of the latrine as well as observation reveal that inhabitants of study villages posses hygienic, semi hygienic and unhygienic categories of latrines. These include waterseal latrine with offset single pit and twin pits, waterseal direct pit latrine, simple pit latrine and hanging latrine.

In *Chhoto Bainnyah, Chhoto Bhatkhali, Assampara* & *Dariabaj* villages many households have hanging latrine. Pit latrine was found in *Chhoto Bhatkhali, Pachgathia,* and *Assampara* villages while waterseal latrines were found in all the villages. Offset latrine with single pit was available in all the study villages except *Assampara* while Offset latrine with two pits was noticed only in *Pachgathia.*

Category wise Latrine Coverage

Findings shows that all households in *Chhoto Bhatkhali* and most of the households of rest of the study villages have some form of latrine.

In *Chhoto Bainnyah,* majority of the households have some form of waterseal direct pit latrine. Nearly same numbers of households have hanging latrine. A few numbers of households' possess waterseal latrine with offset pit.

In *Chhoto Bhatkhali,* majority households use waterseal latrine, which include nearly equal number of households having direct pit and offset pit latrines. A mentionable number of households have pit latrine and nearly same number of households possess hanging latrine.

The highest percentage of pit latrine was found in *Pachgathia*. Majority households in *Pachgathia* have pit latrine while considerable number of households has waterseal direct pit latrine. An insignificant number of households possess waterseal latrine along with two offset pits.
In *Assampara* most of the households have waterseal latrine with direct pit while a mentionable number of households have pit latrine. In addition, few households have hanging latrine.

Maximum numbers of hanging latrines were found in *Dariabaj* village. Most of the households in this village possess hanging latrines and some of the households have waterseal direct pit latrine. Waterseal Offset pit latrine owned by few households.

Table: 3.1: Latrine category wise household coverage

Village	Overall latrine coverage (HH% have latrine)	HH% have Hanging Latrine (Unhygienic latrine category)	HH% have Pit Latrine (semi-hygienic category)	HH% have Waterseal Latrine (hygienic category)		
				HH% have Direct pit Latrine	HH% have Off set pit Latrine	HH% have Offset two pit Latrine
Chhoto Bainnyah	100	41.2	0	47	11.8	0
Chhoto Bhatkhali	78.4	16.2	16.2	24.3	21.6	0
Pachgathia	69.4	0	36.7	26.3	4.1	2.2
Assampara	65.4	3.8	11.5	50	0	0
Dariabaj	70.4	55.6	0	11.1	3.7	0

Source: Observation

Number of Rings used in various type of waterseal latrine

It is important to note that number of ring used for the waterseal latrines varies from village to village due to the variation of environment. In *Chhoto Bainnyah* majority households use 5 to 7 rings according to the height of homestead while in *Pachgathia* majority people use 5 rings. In *Chhoto Bhatkhali* Caritas promotes 3 rings latrine. As a result households' having waterseal latrine mostly use 3 rings. In *Assampara*, taking the advantage of stony ground of the area, waterseal latrine users mostly use one ring.

Type of Slab and Pan used with it

Slab design

In the study-villages two types of slab design were noticed. These are circle and square type slabs. However, maximum number of households are using circle type slab. Apart from the outer shape, slabs available in the study villages also differ in footrest's height. All most all slabs have footrest with a height of one and half inch. However, a few slab, which are mostly home made and square in design have height of a brick (2.5 inches).

Pan

Findings reveals the existence of two types of plastic pan, two types of concrete pan and a single type of ceramic pan. These are, plastic pan that need attachment of gooseneck separately to ensure waterseal, plastic pan with U trapped waterseal pipe, concrete pan with gooseneck/waterseal and without gooseneck/waterseal, and ceramic pan.

In *Assampara* and *Dariabaj* all the waterseal latrines have concrete pan with gooseneck category while in *Pachgathia* most of the rseal latrines have concrete pan including both with and without gooseneck categories. However, a few latrines have simple plastic pan, which needs attachment of gooseneck separately, and a marginal number of latrines have ceramic pan. *Chhoto Bainnyah* presents nearly same scenario. Most of the waterseal latrines have concrete pans with gooseneck category while few of it have plastic pan that needs attachment of gooseneck separately. Plastic pans with U trapped waterseal pipe were found only in the *Chhoto Bhatkhali* village. Locally this type of pan is known as Caritas model. All most all the waterseal latrines have this type of pan while a few have concrete pan with gooseneck category. It is important to mention that most of the latrines that are installed within last one year have plastic pan while latrines installed much earlier possess concrete pans.

Superstructure:

All the latrines of the study villages have some form of superstructure irrespective of its category. However, most of latrine-superstructures of the studied villages except *Chhoto Bainnyah* are without roofs. People use fertilizer and cement bags which are made of plastic or jute yarns, polythene sheets, banana and palm leaves, bamboo, coconut and areca wood, mud, tin and Bricks for latrine structure.

However, it is very interesting to observe that most of the hangings latrines are without roof but it is not true for *Chhoto Bainnyah.* There, most of the hanging latrines have well shaped roofs. In *Pachgathia* well formed superstructure were observed. A mentionable percentage of households have built small huts made of mud as latrine superstructure.

Table: 3.2: Materials used for the construction of Latrine-superstructure

Village	Polythene /Jute Bag/ Plastic/ and Banana / Areca/ palm leaf	Bamboo/ Coconut/ areca Wood	Mud	Tin	Brick	Have Roof	Do not have Roof
Chhoto Bainnyah	10	60	00	20	10	90	10
Chhoto Bhatkhali	50	30	00	05	15	30	70
Pachgathia	22	48	20	00	10	42	58
Assampara	24	60	00	16	00	45	55
Dariabaj	41	33	00	12	14	20	60

Source: Observation

Can all the hygienic/semi hygienic category latrines be treated as hygienic/semi hygienic latrines: (Condition of the pit and waterseal)

Hygienic latrines should at least ensure safe disposal of human excreta and control spreading of foul smell and entrance of insect inside the pit while a semi-hygienic latrine should ensure at least safe disposal of excreta. Otherwise they can be called as hygienic and semi-hygienic respectively. It simply means that all types of waterseal latrines should have proper wealseal and pit while pit latrines should have proper pit.

However, observation reveals that many latrines, which generally fall under the pit and various types of waterseal latrine categories, do not have these essential features. Therefore these latrines cannot be treated as semi-hygienic and hygienic category latrine respectively. It was noticed that gooseneck/syphone of majority waterseal latrines were improper or totally absent. Therefore these latrines can be treated as pit latrines but not as waterseal latrines.

Table: 3.3: Condition of the Syphone/Gooseneck of the Waterseal latrine

Village	HH% have waterseal category Latrine	HH% have waterseal latrine with proper Gooseneck/syphone	HH% do not have Waterseal Latrine with proper Gooseneck/ syphone	Percentage of waterseal latrine do not have proper waterseal
Chhoto Bainnyah	47	11.7	35.3	75.11
Chhoto Bhatkhali	24.3	2.3	22	90.53
Pachgathia	26.3	7.9	18.4	70
Assampara	50	0	50	100
Dariabaj	11.1	7.4	3.7	33.33

Source: Observation

It was further observed that excreta in some of the pit, waterseal direct pit and Offset pit latrines do not remain sealed within the pit as the pits are not proper or a pipe is connected with pit that exposes excreta in open environment. Therefore latrines in these conditions should be treated as unhygienic latrine and can be called as open latrine.

Table: 3.4: Pit conditions of pit and waterseal latrines

Village	HH% have Latrine that have some form of pit				Total	Have proper pit	Pipe is connected/pit is not proper and excreta do not remain within the pit and latrine can be called open (HH%)	Percentage of not-unhygienic category latrine do not have proper pit
		Water seal Latrine						
	Pit	Direct pit	Single pit Offset	Two pit offset				
Chhoto Bainnyah	0	47	11.8	0	58.8	41.2	17.6	29.93
Chhoto Bhatkhali	16.2	24.3	21.6	0	62.1	48.6	13.5	21.7
Pachgathia	36.7	26.3	4.1	2.2	69.3	67.3	02	2.88
Assampara	11.5	50	0	0	61.5	57.7	3.8	6.18
Dariabaj	0	11.1	3.7	0	14.8	0	14.8	100

Source: Observation

Why hygienic Latrine with hygienic condition are less

Above discussion reveals that majority households have some sorts of latrine, but very few of them can be entitled as hygienic. Why it is so? Study shows that lack of awareness, environmental constraints, not having easy access to hardware components and absence of affordability are the factors responsible for this situation.

Lack of Awareness:

The use of hygienic latrine depends significantly upon the people's knowledge and awareness regarding the health risk attributable to unhygienic latrine use, and having clear idea about the essential features of the hygienic types of latrine.

However, finding shows that people have very low level of awareness on these issues. Most of the people use latrine to maintain the privacy and cleanliness. As a result they give importance to superstructure rather than structure. Most of the people even do not have any idea on waterseal aspect and importance of having proper pit.

People's understanding about the Gooseneck/syphone

Majority people do not have any idea about the function of the gooseneck/syphone component of a waterseal latrine. The popularisation of the waterseal latrine as Ring-slab latrine has seriously narrowed done the people's understanding of sanitary latrine and diminished the importance of waterseal issue. Most of the people feel that once they have latrine made of rings and slab they become the possessors of standard type of latrines, which address the social need. Due to this ignorance about the function of gooseneck/shypone most of the users buy slab without syphone/gooseneck or break it

Nevertheless, some people have sketchy understanding about the function of shypone/gooseneck. According to few respondents gooseneck/syphone reduce the spreading of foul odour while a marginal number of respondents highlighted an issue, which the inventor of waterseal latrine might have not thought. According to them it protects the user from the backsplash of the pit liquid.

People's understanding on pit of a latrine:

The main purpose of having a pit is to confine the excreta in a way that it does not get exposed to open environment. However, most of the people relate it with cleanliness. They think that use of a pit help to keep the homestead clean by restricting the exposure of excreta to domestic animals and poultry. Therefore people do not feel wrong to build hanging latrine on water bodies, releasing excreta into the water bodies from the pit through extended pipe or through creating breach between rings during flood as it takes care of cleanliness of the homestead. It has been observed that a considerable number of households in *Chhoto Bhatkhali* are using long pipes to release excreta in the nearby canal while majority waterseal latrine users of *Chhoto Bainnyah* informed that they release excreta from the pit during flood. As a result they do not need to spend money to empty the pit.

Tradition and culture:

Rural people in Bangladesh prefer to install latrine at the ending edge of the homestead as they consider the whole issue of defecation as unclean. However, during the field study most of the people provided different logic behind this action. They argued that the types of latrine they can afford are not free from disgusting smell and do not have attractive looks, which ultimately encourage them to install the latrine by keeping some distance from the residence. The installation of latrines at distance raises difficulties in maintaining hygienic conditions of the affordable sanitary latrines in the flood, flash-flood and swamp surrounded areas.

Environmental issue:

Certain environmental features of some areas are raising difficulties in the way of maintaining hygienic conditions of the available hygienic types latrine and some times even encourage in using unhygienic types of latrines.

Insufficient space available for installation of hygienic type latrine in the Flood affected and Flash Flood and Swamp surrounded areas

Inhabitants of the flood affected, Flash Flood affected and swamp areas raise the height of the homestead with earthwork to reduce the effect of flooding. The raising of the height of the homestead needs money, labour and time. This ultimately compels people to have much smaller homestead than the plain land area. As a result people have very less space available for building house, open courtyard and latrine. This means for installation of latrine people face space constrains. The issue become further complicated due to the people's preference to install latrine at a distance from residence.

Therefore people prefer to install latrine in a way that it occupies less space of the homestead. The study shows that under this situation people take several types of action to address the issue. These are:

- build hanging latrine
- build the latrine structure on the ending edge of the homestead
- build the latrine structure with rings in a way where a portion of the ring structure remain within the ground of homestead leaving rest in the open air.
- use offset ring pit where the pit is build outside the homestead and major portion of the pit remain visible

In the last three options people use sanitary types of latrine but the problem of erosion of soil and improper joining of rings whither away the hygienic conditions of the structure of the latrine.

Erosion of homestead in flood affected and Flash Flood affected and swamp surrounded areas:

Current, wave, pressure of the flowing water spoils the latrine pit by the erosion of surrounding ground. Even some times they wash away the entire structure of the latrine.

In *Dariabaj* village, which is a flood affected and swamp surrounded, faces twin difficulties in maintaining and installing hygienic latrine. During wet monsoon period homestead face severe erosion as the wave of swamp crash on the homestead areas continuously (raised land). This became more aggravated by flash flood. The result is sweeping away of the latrine structure. This environment discourages to build any permanent form of latrine and residents prefer hanging latrine.

The flood affected village, *Chhoto Bainnyah* presents slightly a different picture. Homesteads of this village generally bigger than *Dariabaj* but much smaller than that of plain land village, *Pachgathia.* People of this village prefer the last three options mentioned in the earlier section. In this village rate of soil erosion is lesser than *Dariabaj.* However, the erosion of soil severely affects the durability of the rings and pit. As a result, maintaining hygienic condition of the pit becomes very difficult.

Imperviousness of the soil raises difficulties to use waterseal latrine in the stony area:

Most of the respondents of *Assampara* raise another difficulty in using available hygienic type latrines in the area. In the area the available type of latrine is waterseal latrine. People argued that latrines with gooseneck requires more water for cleaning which is ultimately responsible for the quick filling up of the pit due to the stony nature of the soil.

Water scarcity raises problem to maintain the waterseal latrine:

Easy water access is very much essential for maintaining the hygienic condition of the latrine. However, the study shows that every body do not enjoy this condition. People in the coastal and hilly regions face scarcity of water that causes difficulties in maintaining hygienic condition of a latrine.

Most of the people of *Chhoto Bhatkhali* complained about scarcity of water for drinking and latrine use purposes. The available water sources like small ponds, canals dries up during the dry season. The situation of the hilly *Assampara* is much serious. Few tara pumps are the only sources of water. As a result, residents of the area always face water scarcity for all domestic purposes. This raises difficulties to maintain the hygienic situation of a latrine.

Table:3.5: Distance between nearest water source and latrine (HH %)

Village	TW/Pump				Well/Pond/river/canal/Swamp			
	Less than 10 meter	10m-50	50-100	150+	Less than 10m	10m-100	100-150m	150m+
Chhoto Bainnyah	38.46	46.15	7.69			7.69		
Chhoto Bhatkhali					40	60		
Pachgathia	12.5	18.75	25	43.75				
Assampara	10.53	10.53	10.53	52.63		15.78		
Dariabaj	6.67	20	26.66	40	6.67			

Source: Observation

Flooding of area raises problem for installation of sanitary latrine:

In the swamp surrounded and flash flood affected village *Dariabaj* faces problem in installation of sanitary latrine. Installation of latrine demands earth filling and this can be only done during the dry monsoon period when the swamp recedes. As a result they bring the hardware components during wet monsoon period through boats but wait till dry season for the installation.

Besides the problem of earth filling the residents of *Chhoto Bainnyah* informed that the regular flooding of the area enhance the cost for latrine installation as they need 6-7 rings due to the height of the homestead.

Not having easy access to Latrine hardware

The study reveals the fact that not having easy access to sanitary latrine hardware is also raising difficulties in installation of sanitary latrines. In many cases Village Sanitation Centres are located in far distance from the households. The access becomes more difficult when proper communication facilities are not available.

Table: 3.6: Access to VSC

Village	Distance of the Nearest VSC	Communication infrastructure	Transportation Vehicle	General Remarks
Chhoto Bainnyah	1 Km	Mud Road	Van	Earlier the village was separated from the area where the VSC is situated by *Khirai* river but recently a bridge on the river is constructed
Chhoto Bhatkhali	8 km	Mud & Harrying bone	Van	Long distance results the damage of latrine components during transportation
Pachgathia	3 km	Mud & Harrying bone	Van	
Assampara	5 km	Mud & Pacca road	Van	Long distance results the damage of latrine components during transportation
Dariabaj	3 km	Water way	Boat	Due to absence of Road waterway remains the only way to transport latrine component but the problem is that during dry season accessing the waterway become impossible as the water of swamp recedes. Therefore people can transport latrine components only during wet monsoon period while can install it only during the dry season when earth is available.

Source: Observation

Affordability:

It is generally assumed that lack of financial affordability is one of major reasons for low sanitary latrine coverage. Interestingly, the study contradicts this assumption. Only a few of the respondents raised the affordability issue. The presence of economic opportunities, sanitation related credit programme and distribution of latrine at subsidised price, in the study villages might have roles for this situation. Therefore, this findings may not represent the situation of rest of the country.

Another interesting finding is that almost all respondents have reservation about the way sanitation promoting organisations address the affordability issue. According to them most of the organizations' promotional activities highlights the structure of the latrine and therefore do not incorporate the cost of superstructure, transportation and installation when they address the affordability issue. They argued service providers by highlighting only the structure of the latrine attempt to diminish the importance of the affordability issue.

Moreover, a considerable number of respondents who earns on daily basis (Shop keeper, day labour, Rickshaw puller etc.) were not ready to buy the arguments that construction of pit and superstructure do not involve any expenses as they themselves can do it. They argue that their involvement with the pit and superstructure construction means loss of income during that particular period.

The inclusion of all these expenses is important for them because they think the poor households might need credit without interest for the installation of sanitary latrine and credit amount should be considered on the basis of all expenses those are associated with entire latrine installation process.

Apart from the above mentioned latrine related expenses, people of the swamp affected and flood affected villages revealed another new area of latrine installation related expenses. They argued that the installation of latrine becomes more costly affair for them than the people living in the non-flood affected areas. In the

flood affected *Chhoto Bainnyah* people have to spend more on rings due to the height of the homestead. Moreover, each year they have to repair the latrine structure with earth filling after the receding of the floodwater. This is also true for Flash flood affected and swamp surrounded *Dariabaj.* In addition, people of this village face problem related to the durability of the latrine components. The durability of the latrine decreases due to the possibility of sweeping away of latrine during flash flood, which ultimately increases the latrine related expenditure of the user. All these expenditure in some extent create difficulties for sanitary latrine coverage.

Inferior/ improper construction of the latrine components:

Inferior quality of the latrine components also restricts the sanitary latrine coverage. It was observed that the quality of the concrete slab with concrete pan produced in the local production centres is not satisfactory. Goosenecks of most of the concrete pans are not constructed properly. Most of the pans' goosenecks do not ensure waterseal. Even the quality of the material used to construct the gooseneck is so inferior that it breaks when stool fall on it. It is also observed that some private production centres produce slab without gooseneck while others produce slab with gooseneck, which are not proper. Lacks of awareness about the significance of gooseneck and lack of skill in producing proper gooseneck are many responsible for this situation.

A few of the respondents informed that the quality of the slab produced in some of the production centre is so inferior that it breaks within few days. Therefore they fear that if they use ring slab latrine during defecation they may fell in the pit. *Nazrul Islam* of *Chhoto Bhatkhali* said, *Amar Baritay Offset Paikhana ahsay kintu jakhan Attior Baritay jai takhan ring-slab-a Paikhana kortay Bhowh Lagai sharakkhan monay hohay Aee Bujhi Bhangay porlam."*

People's preference and views on latrine and its components

Absence of various types of latrines promoted by different organizations in most of the study villages restricted the opportunity to elicit people's relative preference among sanitary latrine technologies. However, the finding shows that people are very clear about the issues that a latrine should address. Moreover, it is possible to provide peoples view on the available latrine technology, and relative preference on the design of various components of the available latrine.

Issues need to be addressed by latrine

Most of the people living in the study area do not have idea on most of the sanitary latrine technologies. As a result they are not in a position to compare various types of latrines to express their preference.

However, almost all the people stated that their preference of latrine technology will be considered by some factors related to affordability, use & maintenance, convenience and social aspects. They will prefer a latrine which:

- Provides maximum privacy
- is easily cleansable
- requires minimum amount of water for cleaning
- durable for longer period

- financially affordable
- restrict foul smelling
- emptying of pit easily possible
- ensure longer interval period for emptying of the pit
- required less space for installation
- Components are easily movable
- not vulnerable to natural calamity

People's view on the available technologies and on the components

Most of the people fail to provide opinion on the latrine technologies available in the area but almost all respondents provided opinion on the various components/parts of the latrine technologies available in the area. These components/parts include flat part of the slab, footrests, pan, and waterseal.

Slab design

In the study areas, two separate designs of the slabs are available in the local markets. These are: 1) Circular slab and 2) Square slab. Among the square and Circular design majority of the people showed their preference for square design and the rest showed preference for Circular type slab. Both groups provided reasons behind their preferred design.

Reasons provided in the support of square design:

- It provides more space within latrine than the circular one
- It provides better support for the construction of superstructure
- Square slab is more durable (Slab producers informed that they use better materials for the construction of square slab and is costlier than circular one)
- During rainy seasons, mud of the four corners of circle slab spoils the whole slab but this situation does not arise if square slabs are used

Reasons provided in support of Circle design

- Rings are circular so circle slab fits well on it
- Four corners of square slab are sharp and thin and most often they break
- The cost of the circle slab is less than square one. (Producers informed that the cost of the square slab is higher (30 to 50 taka) than that of the circle slab primarily for two reasons: 1) for extra space of the four corners it needs more materials for construction 2) better materials are used for square slab

<u>Footrest</u>

Almost all the people showed their reservation over the height of Footrest of slab available in the market. Only a few respondents have showed indifferent attitudes over the height of the footrests.

The footrest of the slabs available in the market generally is one inch to one and half inch heights. However, people want that the height of the footrest should be two and half inches, which a brick generally has. People's preference for this height of the footrest is manifested in the latrine constructed at home. The

observation revealed that the height of the footrest of all the latrines constructed at home is 2.5 inches. Producers are also very much aware about the preferred height but still they promote footrest with less height to keep the construction cost minimum. The increase of footrest's height will increase the cost of construction.

Reason people provided in support of the higher footrest:

- When the height is less they feel a sense of aversion due to the closeness with the unclean pan
- During urine and water use it back splash in the leg.

Pan:

In the study villages mainly two types of pans were found. These are plastic pan and concrete pan. Almost all people showed preference for plastic pan. Reasons for this preference are:

- It has better looks than concrete one
- More durable than concrete one
- Easy to clean
- Need less water to clean than the concrete one

Most of the people do not like Syphone/ Gooseneck

The most essential part of the waterseal category latrines is the gooseneck/syphone. However, the study findings shows that almost all the people do not like this particular component of the latrine. Findings shows that most of the people break the gooseneck or buy slab without gooseneck/syphone. Most of the People put forward several reasons in support of their stand. These reasons are:

- Stool/leaf/waste remain stuck: People complained that due to the presence of gooseneck/syphone stool cannot fall directly in pit and remains stuck within the gooseneck. Besides stool, leaves also remain stuck within it. Installation of latrine without roof behind/under the tree may be responsible for this situation
- Requirement of more water for cleaning: The presence of gooseneck demand minimum two to three *Badna* water to flush the stool from pan. They argue that it is not easy to ensure that all members of household will come out from the latrine and will enter two to three times again in the latrine to flush the pan after the defecation
- Not having easy access to water: Ensuring the cleaning of the pan becomes impossible where people do not have easy access to water source.
- Difficult to clean: due to the shape of the gooseneck cleaning becomes very difficult. Sometime even the gooseneck falls in the pit during cleaning
- Requirement of extra money to buy the syphone: Recently most of the latrine production center use plastic pan and they charge extra 15 to 20 taka for syphone. This reflect people's lack of awareness regarding the significance of syphone/gooseneck of waterseal latrine

People view regarding the reuse of human excreta

Most of the people show their ignorance about the possibility of recycling and using of the human excreta as energy and manuals. However, few people have heard about the use of human excreta as fertilizer. Nevertheless, when the issue and the process of using human excreta as energy and manuals were explained almost all kept silent and evinced uncomfortableness with the whole idea through gestures. Few of the respondents even opposed the whole idea strongly. Even those who have the two-pit latrine showed strong reservation and argued that they are not using two pits latrine for composting purposes but to increase the longevity of the latrine. However, small number of respondents with some hesitation said that human excreta can be used as manual if full composting is ensured. These finding like affordability issue contrast the findings of literature survey (DPHE-UNECEF & VHSS, 1995)[4].

How the sanitary latrine coverage can be increased according to the people:

People provided some suggestions, which they think, will remove constraints towards sanitary latrine coverage.

Suggestions are:

- Ensuing easy access to the water sources
- If possible take steps to ensure availability of water within the latrine
- Develop a type of latrine that need less water for cleaning
- Provide credit without interest for installation of sanitary latrine
- Provide design of a sanitary latrine that can face the effect of natural calamity like flood, flash flood etc.
- Involvement of administration for ensuring the better quality of production
- Involvement of administration to ensure the destruction of the open latrines

[4] Majority of the respondents (53.2%) replied affirmatively to human excreta used as manure.... Products grown with that manure of human excreta smell awful said 10.5% of the respondents who were against its use; those products may not be socially acceptable expressed 4.7% of the same group-see DPHE-UNECEF and VHSS, "Women in the context of Sanitation, Water supply and Hygiene: A village based study," (Unpublished) Dhaka, 1995, p-60

Chapter-IV

Concluding Remarks

The principal purpose of the study was to investigate environmental suitability and people's acceptability of the promoted latrine technologies to trace link between latrine designs and the present undesirable sanitary latrine coverage. The study has been able to address these issues. However, absence of organizations' all promoted latrine technologies in the study area caused some limitation.

In the study area only several types of waterseal latrines besides unhygienic and semi hygienic types latrines were noticed. According to the study, several factors are responsible for the present poor sanitation situation in Bangladesh. Some of the important factors are affordability, unawareness, not having access to quality latrine components, water access problem, and environmental difficulties. All of these issues cannot be addressed only through the modification of the latrine designs. Some of these might need addressing through the change of *WatSan* intervention approaches and strategies besides the modification of latrine designs.

Issue specific Recommendations:

The issues of affordability:

In contrast to the findings of the literature survey only a few of the respondents of the field study raised the affordability issue. The presence of economic opportunities, and distribution of latrine in subsidised price, in the study area might have roles for this situation. Therefore, this position of people may be unique for these studied villages.

Another interesting finding of the field study is that almost all respondents have reservation about the way sanitation promoting organisations address the affordability issue. According to them most of the organizations' promotional activities highlights the structure of the latrine and therefore do not incorporate the cost of superstructure, transportation and installation when they address the affordability issue. They argued service providers by highlighting only the structure of the latrine attempt to diminish the importance of the affordability issue.

Considering the findings of literature review and understanding of respondents of field study regarding affordability this research recommend for the creation of WatSan credit facilities to ensure sanitary latrine coverage among the poor people. Credit in low interest rate can be provided to buy and install sanitary latrine. The credit amount should be fixed on the basis of entire installation cost including the cost of transportation, construction of superstructure and pit.

The credit facilities can also help people who can afford a latrine but not their preferred one due to financial constraints. Credit can help them to buy better sanitary latrines, which ultimately will improve the use of sanitary latrines, as the people will be able to install more comfortable latrines.

Organizations working in the WatSan sector can establish partnership with the Micro Finance organizations (MFI) to arrange WatSan credit facilities. NGO Forum being the apex body can initiate the process on the creation of WatSan credit with the partnership with the National and international Financial Institutions. In the local level, NGO Forum should encourage its PNGOs who have credit programme to initiate WatSan credit in low interest rate in their operational areas.

WatSan credit for the household coverage can be provided directly to the individual beneficiaries while for the community facilities like community latrine user group as a whole will get the credit. Union Parishad (UP) or Village level CBOs could be involved as guarantor for the credit provided for community facilities. UP even can be involved by the WatSan sector organizations like NGO Forum to channelise the WatSan credit in the community level.

The issue of awareness:

The study findings shows that people generally feel that installation of latrine with slab and rings ensures the purpose of having sanitary latrine. They are not aware of the importance of waterseal aspect of a latrine. The popularisation of the waterseal latrine as ring-slab/*chaka* latrine is some extent responsible for it. Moreover when people are not aware of waterseal issue, the issue of ensuring that gooseneck ensures proper waterseal does not arise. Therefore, awareness program should first take effective action to popularise the waterseal latrine as waterseal latrine instead of Ring-Slab latrine and secondly disseminate message on the importance of waterseal as well as on the processes of checking the gooseneck whether it ensures waterseal of the pan or not.

The issue water coverage:

The water coverage issue of most of the major organizations in Bangladesh is centred around the drinking issue. Water needed for latrine use and maintenance have not been considered by sector organizations. This might have been done with an understanding that traditional sources, like ponds, canal, river and shallow tubewell are abundant in Bangladesh, which can be used for latrine related purposes.

However, the study findings revealed serious water difficulties in hilly area and seasonal water difficulties for coastal area. In the coastal area installation of shallow tubewell with 15 to 20 feet depth can serve water need for latrine use purposes. These tubewell should be used strictly for the purposes other than drinking. Keeping the depth of the TW less will take care the affordability issue. Moreover, community owned shallow tubewells (distributed by GO and NGOs) that became dysfunctional due to the lowering of water table and arsenic contamination can be redistributed for the use of latrine purposes. Dysfunctional shallow tubewells of low water table area can be redistributed in the coastal area for the use of latrine purposes. For the hilly area a second thought should be given on the promotion of waterseal latrines. Otherwise water engineers have to think out a water source from where hilly people can get easy access water for sanitation purposes.

Apart from these facilities pipeline water supply facilities should be encouraged in the rural area. This will improve the water access for all domestic purposes. WatSan credit for the community through local government institution can play a significant role in this regard.

Apart from the above discussed water facilities, promotion of various type low cost air seal latrine instead of waterseal latrine in the water scarcity areas (Coastal and Hilly areas) might be able to bring some relieve for the user because it will demand less amount of water for cleaning and maintaining latrine hardware. Therefore an applied research should be initiated by the leading WatSan organisation to judge the technical, environmental and socio-economic viability of the air seal latrine.

Ensuing water access inside the latrine will enhance sanitation related hygiene behaviour:

The finding shows that people have some reservation regarding the waterseal latrine as it demands minimum two to three *Badna* water to flush the stool from pan. They argue that it is not easy to ensure that all members of household will come out from the latrine and will enter two to three times again in the latrine to flush the pan after the defecation. Therefore, if these arguments of the people are taken into consideration than it becomes obvious to ensure proper maintenance and use of latrine by all members demand ensuring water access within latrine. This can be done through following ways:

- Households having better socio-economic condition and have brick latrine superstructure can build a water tank without cover along with the outer sidewall of the latrine and a water tap can be extended inside latrine
- Poor households can use mud pot like *Gurar Motka* whose height is more and breath is less to preserve water outside the latrine and tap can be attached with the mud pot in a way that tap is accessible within the latrine. A Gurar Motka is available in 50 taka and tap for taka 30. Based on the economic condition, households can use plastic drum used for chemical/ other types of drums instead of Mud one. However, this will demand promotion of these types of water pots/water tank through the creation of local Sanitary Mart

Ensure environmentally suitable latrine design for the flash flood and Flood affected areas:

In the flood affected and flash flood affected areas the cost of extra rings and affect of the soil erosion could be minimized if a slight modification on the latrine structure design is done. In these areas pit can be constructed from the natural ground level instead of on the homestead ground and slab installed on the homestead ground level can be connected with the pit through a long straight pipe from pan. These will reduce the effect of erosion as well as the expenses on the extra rings.

The latrine coverage approach:

One of the major findings related to open defecation is that a major portion of the adult population most of the time remain in the working places like agricultural field, river bank etc

where latrines are not available. As a result, during working hours considerable percentage of people practice open defecation. This type of open defecation cannot be addressed only through household based latrine coverage. New strategies should be incorporated to address this issue.

Moreover, in the area like *Dariabaj* where space for latrine construction is a problem as well as remain under the threat of sweeping away of the latrine hardware by the flash flood, household based latrine coverage approach needed to be reconsidered. In this type of area community latrine with heavy construction might be able to address the sanitation issue more effectively.

The issue of superstructure:

According to the study finding latrine users' priority is privacy and that's why the superstructure has a great significance for latrine users. Therefore the issue of superstructure should be brought under the sector organization's promotional activities.

Sectors organizations should encourage private sector to address the latrine superstructure by innovating various types of cost, environment and style wise options to address affordability, comfort and convenience. Even the leading organizations of the WatSan sector can provide various designs and training to the local artesian to make various types of artistic superstructure and promote them through Sanitary Mart. For instance, a skill artesian with bamboo/ Jute straw would be able to make various types of superstructure with pleasant looks. If a superstructure has pleasant look it will enhance the users' comfort, which ultimately can increase the latrine use by the community people.

The issue of Footrest:

Study finding showed that people do not like the height of the footrests promoted by the VSCs. They like footrests having the height of a brick (two and half inches). Therefore latrine producers should be encouraged to produce slab with different heights of the footrests to address the people's preference. The increase of height may raise some difficulties because squatting on a footrests having the height of a brick increase the risk of spoiling of the surrounding of the latrine during defecation. However, to ensure latrine use, the people's preference should be taken care of.

In brief the study recommends for the creation of WatSan credit through the development of partnership with micro finance and finance institutions and involvement of the Local Government Institutions (LGI) to make the sanitation programme more effective. Moreover air seal latrine and community latrines can be promoted on the basis of environmental needs. The most important recommendation is that water access approach should also address the needs of latrine use and maintenance. Furthermore ensuring water access within the latrine can improve the use of latrine by all family members. This will demand the promotion of facilities that can ensure water access within the latrines through creation of sanitary marts.

Besides these programme strategies and activities, this research recommend for further researches in various areas. The time and financial constraints have restricted the liberty of researcher, which ultimately had imposed some limitation on the virtue of the present research. Number of villages selected for the research was very small. Moreover, FGDs could not been

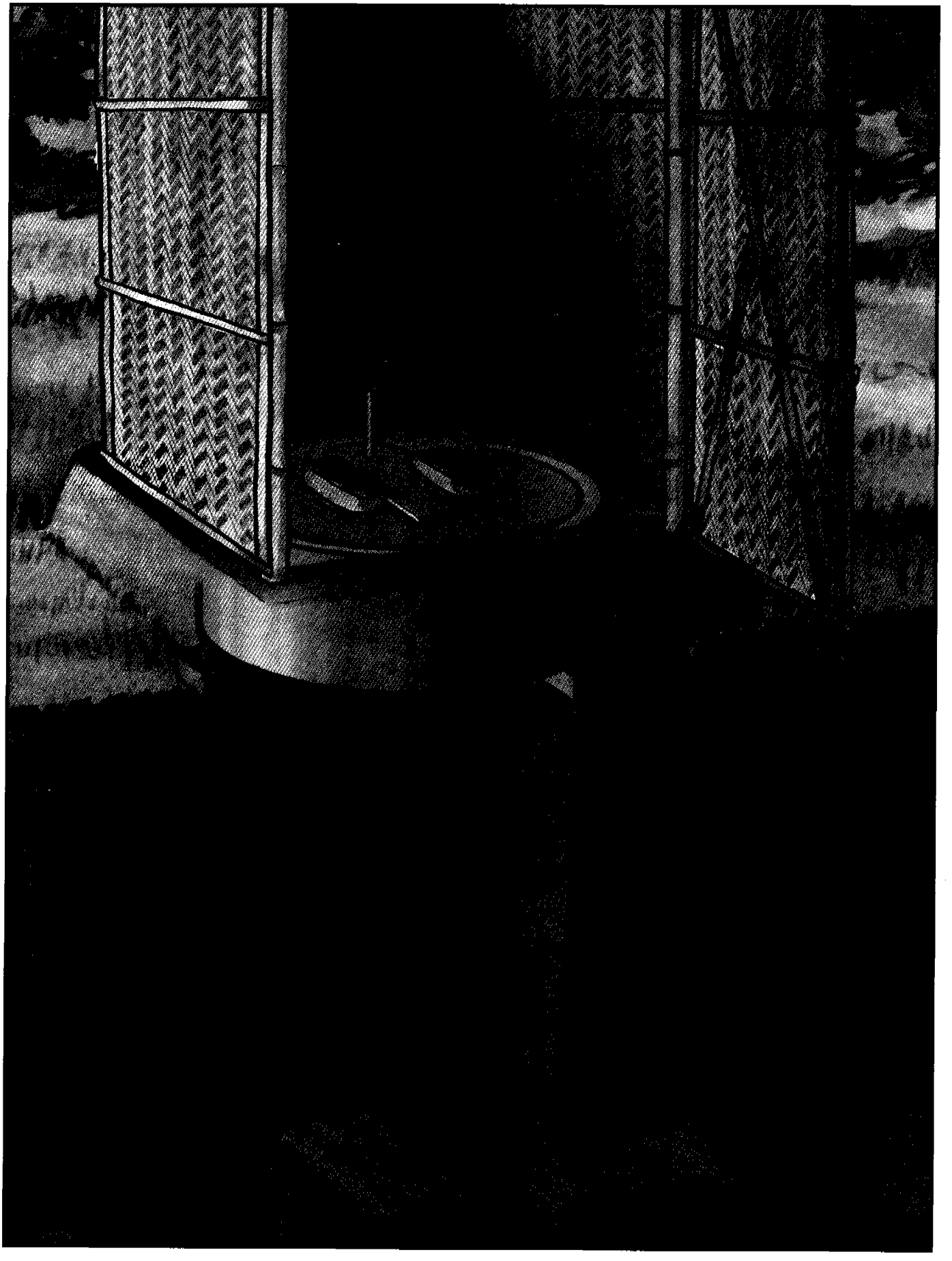
arranged on the basis of socio-economic categories of the participants because all the FGDs' were arranged on spot during the field visits. As a result data analysis on the basis of socio-economic background of the respondents were dropped to avoid wrong interpretations. Therefore to understand the affordability issue of latrine technologies further research should be undertaken.

Moreover, to understand comparative preference of latrine users, an applied research study should be undertaken among the users of all types of latrines promoted by various organizations.

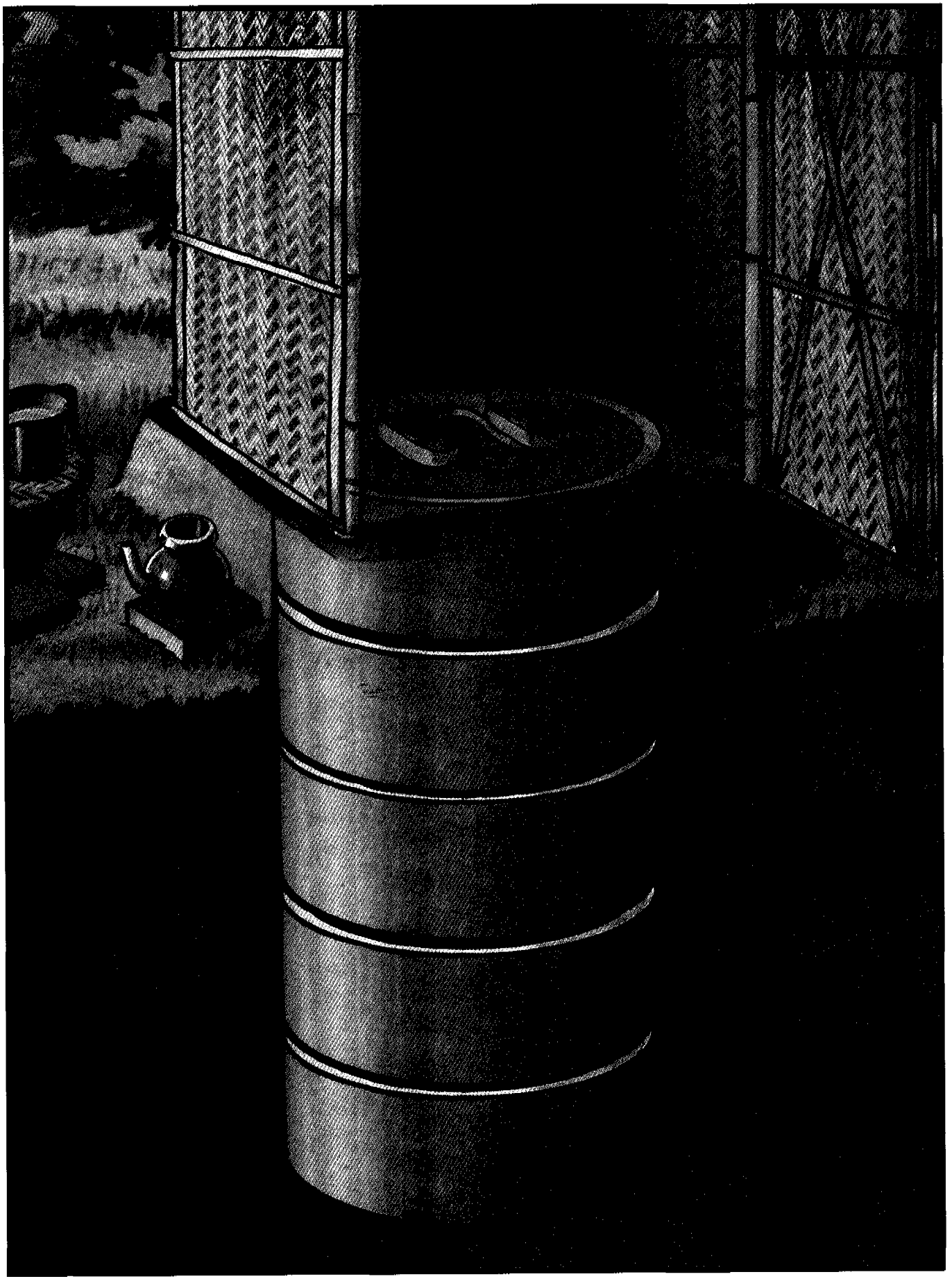
Furthermore, action research should be undertaken to judge the social, financial, technical, and environmental suitability and viability of the air seal latrine in the water scarcity areas and on the facilities that can ensure water access inside the latrine.

Appendices

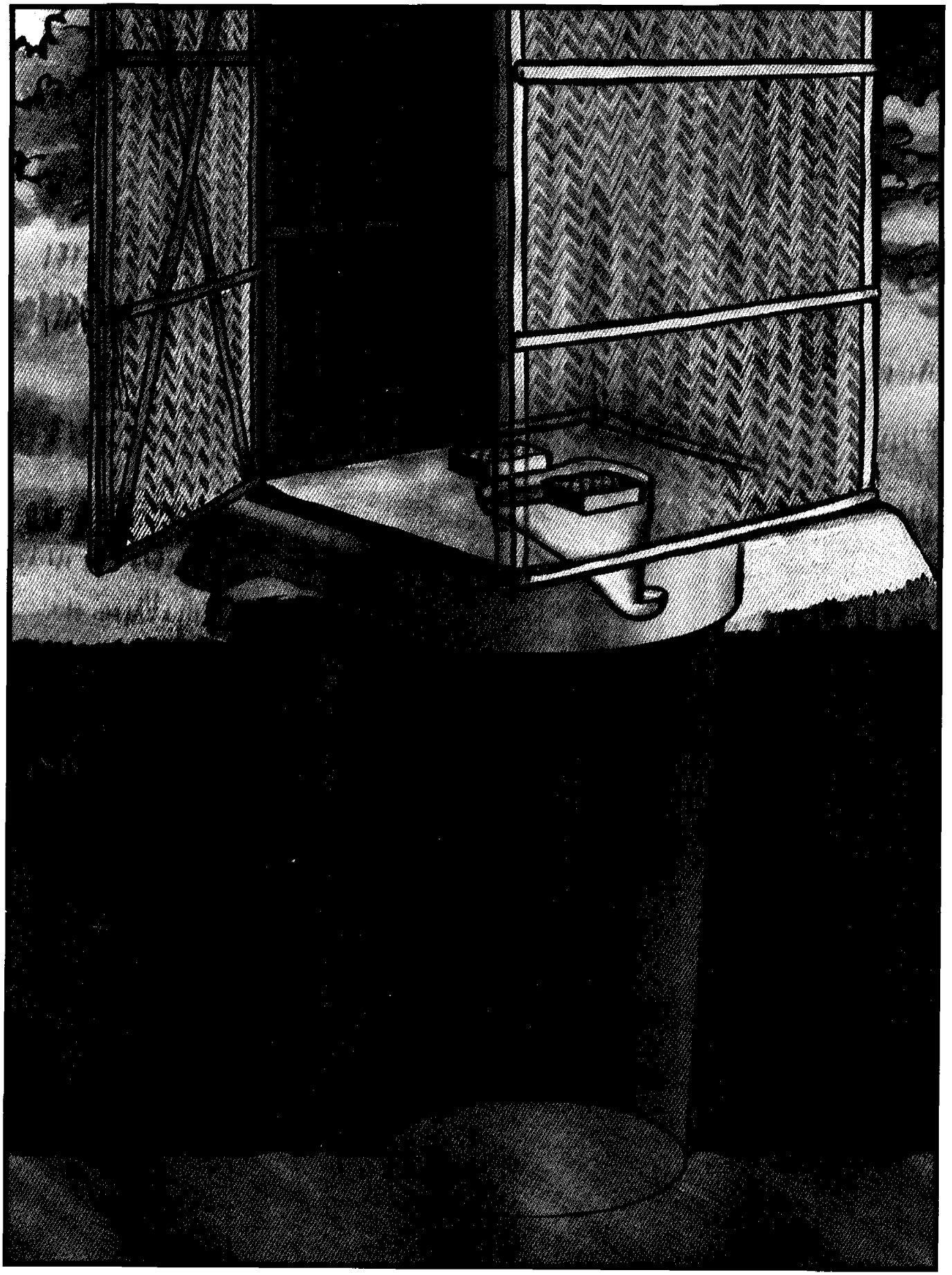
Appendix : A : Designs of NGO Forum promoted Latrine options



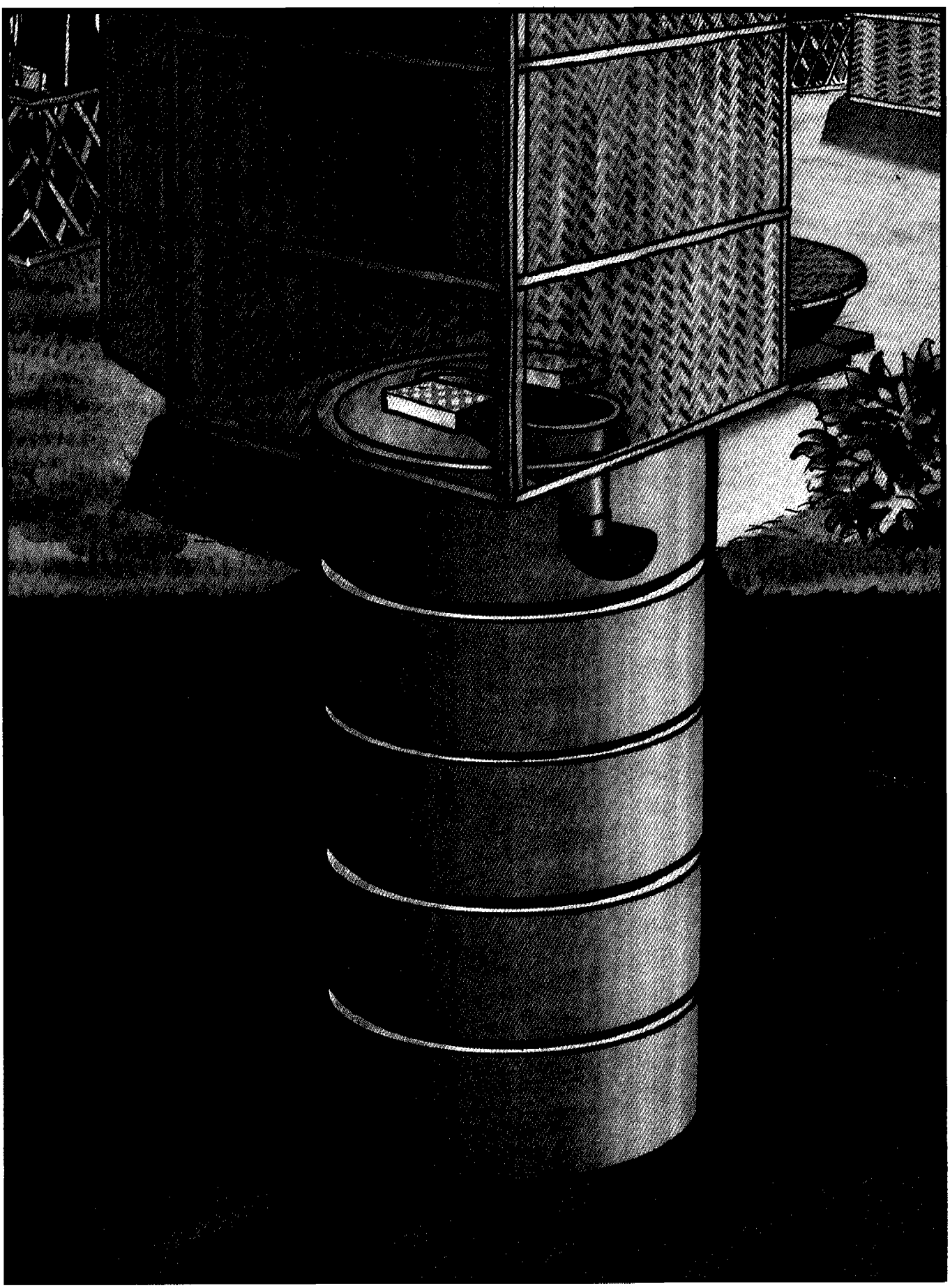
San Plat Latrine



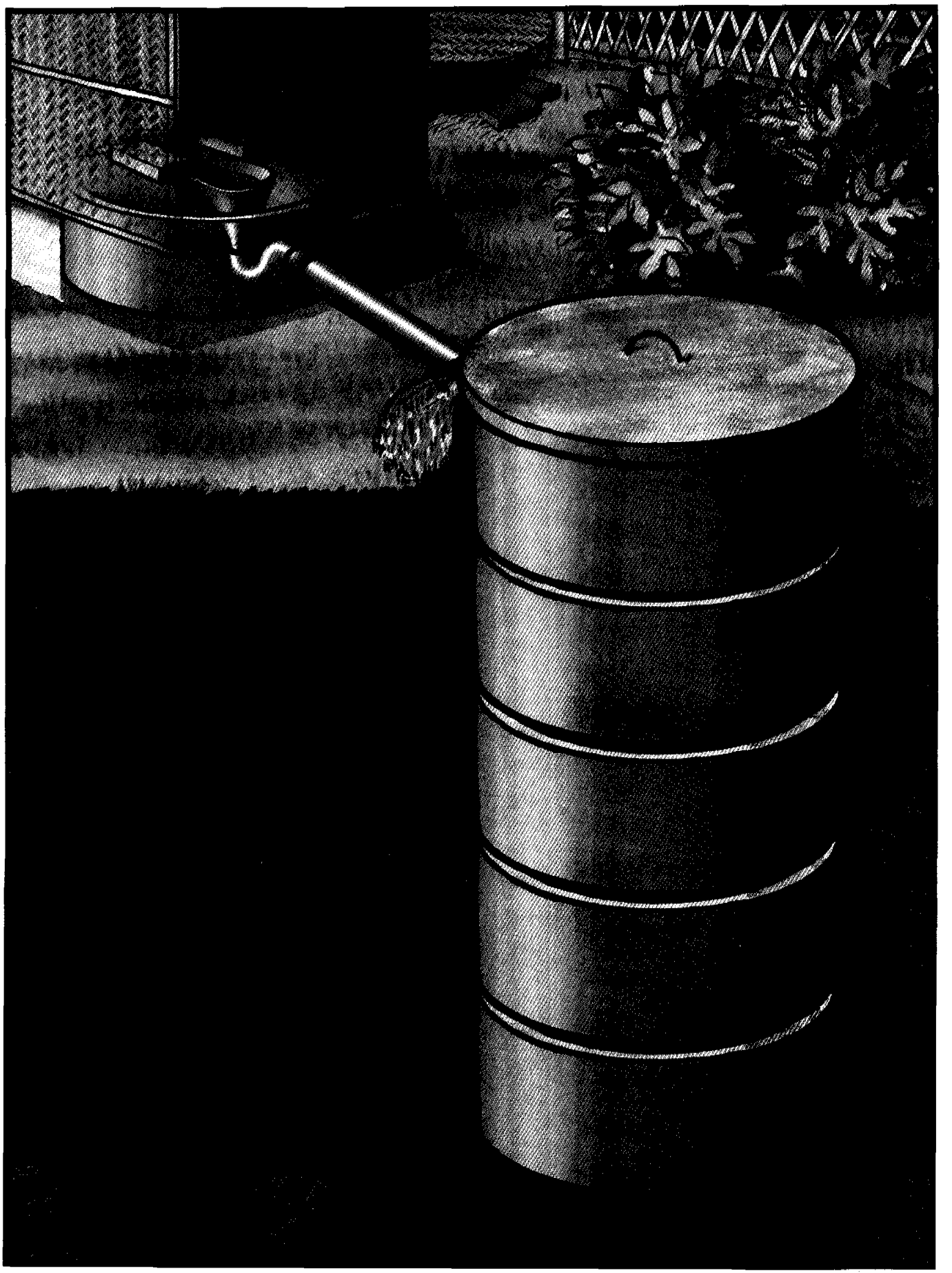
Water-seal Latrine (C.C. Pan)



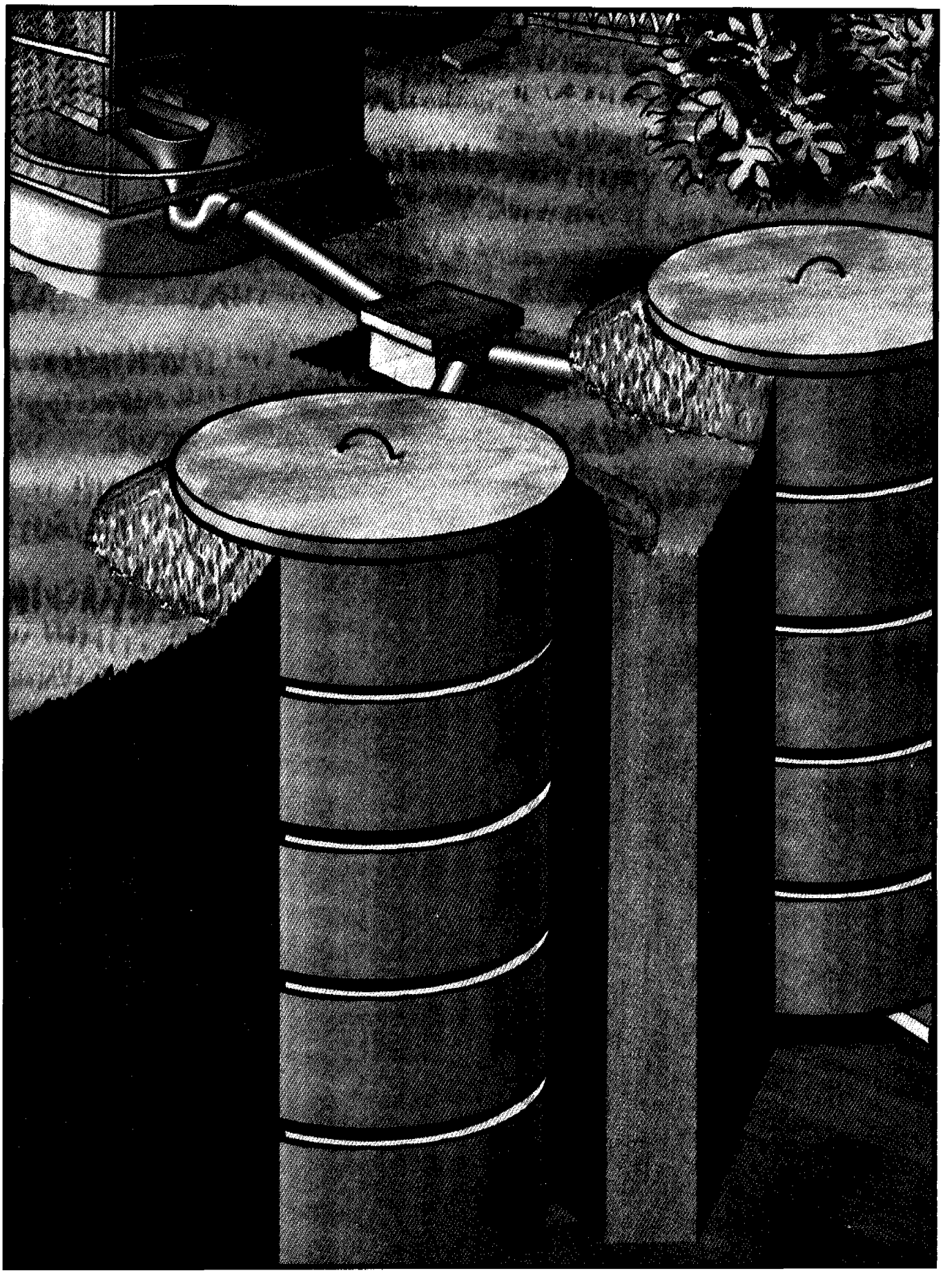
Water-seal Latrine (1 slab, 1 Ring.)



Water-seal Latrine (PVC Pan)



Offset Pit Latrine



Offset Twin Pit Latrine

Appendix-B
Check list For Key Informant Group –A
Teacher/local leader/NGO staff

Geo-hydrological Area.....

General Information

Para/ward/locality: Village Union

Upazila/Thana District

Natural geography:

- Hilly
- Riveraine
- Low land
- Salinity
- Type of soil (soft/hard, permeability)

Type of natural calamity:

- Flood (interval, last time, type of destruction)
- Drought
- Cyclone

Demography:

Total population of the area:

- Religion wise percentage
- Ethnic wise percentage
- Gender wise
- Age-wise
- Disable population and percentage
- Total Household
- Household size

Socio-economic:

- Economic activities of population
- Economic status of the area
- Profession wise percentage of household
- Educational status of the area

The area in respect of Development issue:

- Road
- Dam
- Cyclone center
- Economic opportunity
- Health center
- Educational Institution
- Religious institution

Health situation:

- Types of disease among villages and degree of problem
- Health problem faced by children (under five)
- Diarrhea issue
- The role of government and Non government organization
- Availability of the health service

Water coverage:

- Surface water availability and quality (season wise)
- Tw water availability and quality
- Other sources

Water use:

- Drinking
- Cooking
- Bathing
- others

Village position in respect of the WatSan programme coverage

- Government initiatives
- Non-government initiatives

Villagers' Defecation practices (open defecation and Latrine use):

- Male
- Female
- Under five children

Latrine coverage:

Explain the reasons behind the defecation practices and latrine coverage

- Cultural reasons
- Economical
- Social

Types of latrine available in the area

- Hanging latrine situated on the land
- Hanging latrine on the water bodies
- Pit latrine
- Mud ring waterseal latrine
- Concrete waterseal latrine
- Plastic pan water seal latrine
- Offset latrine
- Two pit latrine
- Other

Villagers view about various categories of latrine

- Advantages
- Disadvantages

Date.....

Check list For Key Informant Group –B quacks/doctor

Geo-hydrological Area.....

General Information

Para/ward/locality: Village Union
Upazila/Thana District

Health situation:

- Types of disease among villages and degree of problem
- Health problem faced by children (under five)
- Child mortality
- Gender wise diseases
- WatSan related disease
- The role of government and Non government organization
- Availability of the health service

For diarrhea and other diseases people goes to whom

- Doctors
- Quack
- Religious leader
- Treat themselves

Water use:

- Drinking
- Cooking
- Bathing
- others

Villagers' Defecation practice (open defecation/ latrine use) : (estimated percentage)

- Male
- Female
- Under five children

Latrine coverage:

Explain the reasons behind the defecation practices and latrine coverage

- Cultural reasons
- Economical
- Social
- other reasons

Hygienic situation of the latrine use by the villagers

Hand washing practices

- Before meal
- After defecation
- After handling the children's feces

Date.....

Check list For Key Informant Group –c (Mason)

Geo-hydrological Area.....

General Information

Para/ward/locality: Village Union

Upazila/Thana District

People from which community comes to you for purchasing of latrine material?

- Religious group
- Ethnic group
- Socio-economic group

Which type of latrine they prefer?

What are the factors people consider in purchasing latrine?

- Cost
- Water seal
- Design
- Pan type
- other components

What type of complain people make about various type of latrine materials?

From how far people come to you to purchase latrine materials?

What should be done to improve latrine use?

Do you have any observation about latrine's components particularly about the water-seal?

Checklist for transect and observation

Date.....

Geo-hydrological Area.....

General Information

Para/ward/locality: Village Union

Upazila/Thana District

Type of the latrine

Distance between latrine residence

Distance between latrine and nearest water source

Cleanliness of the inside and out side of latrine

The condition of the water-seal

Ash/soil/soap/ and water are preserved near the latrine or not

Drinking water pot is clean or not

Overall environment of the locality in respect of hygiene environment

- Smell of excreta in the area
- Human excreta in the road side/field/bush/courtyard
- Where the domestic waste are kept

Date.....

Checklists for the community people

Geo-hydrological location.....

General Information

Para/ward/locality: Village Union

Upazila/Thana District

Demographic information about FGD attendance and their family members:

- Religion wise population
- Ethnic wise religious
- Gender wise
- Age-wise
- Disable population
- Educational background wise population

Type of natural calamity:

- Flood (interval, last time, type of destruction)
- Drought
- Cyclone
- Others

Health situation:

- Types of disease among villages and degree of problem
- Health problem faced by children (under five)
- Child mortality
- Gender-wise health problem
- Diarrhea issue
- The role of government
- Ngo government organization
- Availability of the health service

Water coverage:

- Surface water availability and quality (season wise)
- TW water availability and quality
- Other sources

Water use:

- Drinking purposes
- Cooking
- Other purposes

Hand wash practices

- Before eating
- After defecation
- After handling the children's feces

Village position in respect of the development activities of Govt and NGO

- WatSan Activities
- Sanitation program
- Other development activities

The issue of defecation:

Open defecation:

- River/canal site defecation
- Open field and roadside and bush
- Male and female
- Under five children

Why open defecation?:

Latrine coverage:

The need of using latrine (if possible measure the priority by numbering 1 to onwards)

- Privacy
- Social status
- Health
- Cleanliness
- Others

Do your family use latrine if yes why and if no then also why?

Types of latrine available in the area

- Hanging latrine situated on the land
- Hanging latrine on the water bodies
- Pit latrine
- Mud ring waterseal latrine
- Concrete waterseal latrine
- Plastic pan water seal latrine
- Offset latrine
- Two pit latrine
- Other

Which type of latrine your family use?

Why you use particular type of latrine?

- Affordability
- Easy to maintain
- Longevity
- The issue of Fly & Smell
- Can be install near the home

Which type of latrine is good (priority wise number 1 to onwards) and why?

What is good and bad about pit latrine?

- Smell
- Flies
- Filling up of the pit
- Fill wall falls
- Others

What is good and bad about water-seal concrete slab and pan?

- Smell
- Flies
- The longevity of the slab
- The longevity of the water seal
- Water seal normally break
- Water seal normally fall down
- Other problems related to water seal
- Stool remain there
- Need more water for cleaning
- Costly

What is good and bad about plastic pan water-seal ?

- Smell
- Flies

- The longevity of the slab
- The longevity of the water seal
- Water seal normally break
- Water seal normally fall down
- Other problems related to water seal
- Stool remain there
- Need more water for cleaning
- Costly

What type of problem you face with latrine that has mud ring?

What type of problem you face with latrine that has concrete ring?

What types of problem you face with single pit latrine?

What types of problem you face with twin pit?

What is good and bad about septic tank latrine?

What is good and bad about VP latrine

What is good and bad about other type latrines (if the participants mention about any other type of latrine)

Do you prefer latrine other than pour-flash?

The Issue of Superstructure

- Why and What type of superstructure people use for latrine
- Problem related to superstructure

Do you think existing latrine design need improvement?

- Structure
- Slab
- Pan
- Waterseal
- Superstructure
- other components

Do you ready to use two pit latrine's night soil for manual use?

Do you ready to use the Bio-gas plant connected to latrine?

- For lighting purposes
- For cooking purposes
- Others

What should be done to ensure sanitary latrine use by all people and all family members of your area?

How can community improve the WatSan situation?

What can government do in respect of Sanitation coverage?

What can NGOs do for the sanitation coverage?

Name of the FGD participants:

Appendix-C

People who were involved with the Research as Data Collectors and Respondents

A. Study village(s) wise Researcher(s) involved in Field level Data Collection

Name of the Study Village	Associate Researcher (s)	Principal Researcher
Chhoto Bainnyah	• Md. Ashraf Hossian • Dabashis Chokrabarthy (SIDA)	Avizit Reaz Quazi
Chhoto Bhatkhali	• MD. Azmal Hossain	
Pachgathia	• Zahiruddin Babar • Ms. Parul (SEBA) • Mr. Motalab (SEBA)	
Assampara	• Zahiruddin Babar	
Dariabaj	• Zahiruddin Babar • Abdus Salam (ASD)	

B. Village- wise Names of the Key Informants, Participants of Group discussion, respondents of transect and household heads of the observed houses

Assampara

Md. Golam haider	Ab. Wahid Batai	Ad. Malaik	Habibur Rahman,	Ab.Samad
Fazal Mia	Ab. Shahid	Ab Rafiq	Rabia Begum	Taslia Begum
Md. Joynal Abiden	Md. Abudl Hai	Ramjan Ali	Shahjahan	Rahela
Jahanara Begum	Halima	Rabia	Rina	Joshna
Ayshah Begum	Manowara	Maharun	Afia Begum	Misira Begum
Fatima Begum	Taiwabunnasha	Gulshan jahan	Rajabunnesha	Rokea begum
Majida	Dudmaher	Parvin	Shafia Begum	Alak jan
Shahera Khatun	Parul	Hosnayara Begum	Nilu Chakraborty	Lal Mia
Ab. Mannan	Ali Akbar	Tashar Ali	Mafiz MIA	Majibur Rahman
Anwar Hossain	Nazrul Islam	Ab. Rashid	Abutaher	Altaf Hossain
Ab Wahab	Nur Islam Mia	Ismail Mia	Shamshul Islam	Ab. Kasham
Tazul Islam	Suruj Mia			

Chhoto Bhatkhali

Yashuf Ali Sardar	Mustafa Kamal	Kazal Kumar mandal	Dr. Md. Shaiful Islam
Ashakur Rahman	Arshad Dactar	Akkas Ali Sardar	Ab. Gaffur Sardar
Nazrul Islam	Md. Azibor Dhali	Solaiman Gazi	Ishaq Gazi
Muhammud Ali Gazi	Oziar sardar	Munshur Sardar	Yanus Sardar
Dr. Solaiman	Alauddin Sardar	Kabir Gazi	Khabir Gazi
Ashirun Nasha	Mahiuddin Gazi	Razaul Gazi	Habibulla Gazi
Hafizul Islam	Aziz Gazi	Wajed gazi	Karim Gazi
Oziar gazi	Anisur rahman gazi	Ab. Rashid Gazi	Jainal Gazi
Kaoshar Gazi	Nowab Ali	Hasan Ali Mullah	Aklima
Sunnat Ali Gazi	Alhaz Arman Sardar	Nazrul Sardar	Maharram Gazi
Shafiqul gazi	Ab. Aziz Sardar	Maharram Gazi	Mamin Ali gazi

Dariabaj

Ershad Ali
Yashub Ali
Maskura Beguma
Minara
Fatima
Halena
Md. Mutalib
Ahed Ali
Md. Shamshir Ali
Julfu Mia
Ab. Bashid

Buzlul Karim
Kulshur:
Miras Ali
Jahanara Khatun
Fulzan
Alima
Mushaddar Ali
Nur Islam
Miafor Ali
Shapon Mia

Md. Zamal Uddin
Nuranahar
Rahamat Ali
Shamraj Bibi
Shamshurnahar
Jobaida
Md. Addul Hanan
Siraj Mia
Arfot Ali
Iyab Ali

Mainuddin
Jainal Abedin
Nura Nahar
Samranj Begum
Shayfon
Jomila Khatun
Ab. Guffer
Md. Kahim Ali
Ab. Khair
Mutalab Mia

Ab. Rauf
Giashuddin
Ab. Hasim
Anwara
Fulbanu
Nowab Ali
Shahab Ali
Dalim Mia
Md Din Islam
Ab. Batan

Chhoto Bainnyah

Korshaid Alam
Ataur Rahman
Laily
Halima
Manju Rani Das
Halima Begum
Mutaleb
Barik Member
Bashanta Rani Shel
Jahura Begum
Md. Abbas Uddin
Taslima
Md. Chhunu
Md Hatim Ali
Md. Baccuh

Md. Tawib Ali
Rayhana Akter
Adul Rashid
Hanif
Shahela Begum
Kartik Chandra Das
Alamgir
Md. Aftab Uddin
Giribala Shel
Manowara Begum
Md. Chhan Mia
Md. Tajim Uddin
Md. Raisuddin
Ab. Rahim Bawati
Md. Nazmul Hossain

Md. Faruk
Rozinah Saleha
Musharraf
Shayeed
Shakeel Uddin Sheik
Kalam
Zahanara
Abdul Malak raja
Archnarani Shel
Zariman Begum
Ab. Mazid
Md. Khaeemuddin
Muhammad Ali
Afshar Ali
Nova Sharkar

Nazrul Islam
Jarina
Rokayah
Sajjeda Begum
Rahima Begum
Md. Kadir Ali
Shafi
Avarani Bardan
Shamol Shel
Amirzan Begum
Mamtaz
Dhandu Mia
Md. Adul Ali
Md Danajmolla

Razibul Islam
Begum
Jahanara
Mehera Begum
Firoza Begum
MD Chunnu Mia
Amazad
Alorani Shel
Shubal Shel
Ab. Kadir
Rashida
Md. Zamat Ali
Md. Nazimuddin
Salaman

Pachgathia

ManMohan Dabnath
Rahim Ulla
Ab bari Munshi
Mashud Ahmed Salim
Krisna Chandra Debnath
Alimullah
Rajibullah
Firoza Banu
Eyakubullah hazi
Gobindra Chandra Nath
Md. Ab. Salam

Md. Ikbal Mia
Madu MIA
Ab. Shubahan
Birandra Dabnath
Haripada Dabnath
Ab. Kadir
Shamshul haq
Milikchan
Alhaz Ab. Hashim
Shuvas Chandra Nath

Abul Hossain
Ab. Shaheed
Ab. Nur
Binandru Kumar
Poreshchandra
Hakim Shaheb
Md. Ab. Gani
Shamshunnahar
Edris Ali
Dhirandra Chandra Nath

Shamshul Alam
Dalwar Hossain
Taiwab Ali
Yashub Ali
Gabinda Dabnath
Mafizullah
Iyab Ali
Shafar Ali
Eshak Ali
Dhirandra Chandra Dabnath

Nazmul Alam
Md. Ali
Ab. Rab
Shabu Mia
Shafikullah
Alta Mia
Ambia Khatun
Ramchan Begum
Ab Zalil