THE 1991 NATIONAL SURVEY ON STATUS OF RURAL WATER SUPPLY AND SANITATION FOR DPHE/UNICEF

Final Report

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August 1992

C O N T E N T S

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EXECUTIVE SUMMARY

The National Survey carried out during November 1991 through January 1992, was intended to investigate into situations pertaining to the water supply and sanitation sector in the rural and urban slum areas of the country. This presentation contains the salient findings from the survey.

Coverage of, accessibility to and use of HPSs

In Bangladesh, most households in rural areas and in the urban slums and fringes, now have access to the HPS (hand pump system) at least for drinking water, 96 percent in the rural area and 94 percent in the urban slums and fringes. Most widely used HPSs were shallow tubewells covering 77 percent of households in the rural area and 88 percent in the urban slums and fringes. Deep tubewells were used by only 12 percent of households in the rural area and by only 3 percent in the urban slums and fringes. Coverages of other types of HPSs including Pond Sand Filters (PSFs) and Ringwells were extremely low.

Along with government's distribution of tubewells, sinking of private tubewells had a significant contribution. In the rural area, private HPSs (49.2 percent) had almost equal coverages of users as had public HPSs (50.8 percent). In the urban slums and fringes, coverages of the private HPS were even more pronounced, with three out of every four user-households there depending on it. However, relative service coverage of a public hand pump system was much higher compared to the private hand pump system's. In the rural area were 10.8 households estimated to be served on average by a public tubewell compared to 4.4 households served by a private tubewell. For the urban slums the ratio was 9.4 households served by a public tubewell compared to 3.9 households served by a private tubewell. In terms of population, a public tubewell covered 60 persons in the rural area and 50 persons in the urban slums and fringes. The corresponding number for a private tubewell was 25 persons for rural areas and 21 persons for the urban slums and fringes.

With wide spread availability of HPSs, the vast majority of hand pump users, both in the rural area and in the urban slums and fringes, now have had HPS within a perceived distance of 150 metres. In the dry season, 85 percent of the households reported to be obtaining water from a HPS located at a perceived distance of 150 metres or less in the rural area and about 98 percent in the urban slums and fringes. Distance of the HPS increased in the wet season for some households. On average, a household required 15 minutes in the rural area and 7 minutes in the urban slums and fringes to obtain water from the HPS in the dry season.

However, time required in the rural area rose significantly in the wet season, upholding the increased inconveniences the rural households faced in obtaining water from the HPS during that season. There were, however, almost no variations between the dry and wet seasons in the urban slums and fringes. As expected, users spent much less time when they obtained water from the private HPS than when they obtained water from the public HPS. The variations were, however, not as remarkable in the urban slums and fringes as in the rural area. Accessibility to the HPS increased with socio-economic status. A household was more likely to have easy accessibility to a hand pump system if it was from the higher socio-economic status group.

Despite almost universal access to the HPS, use of the full requirement of water from it still remains low. In the rural area, only 16.3 percent of households were found obtaining all the water they consumed from the HPS while a quarter of households kept their use of water from it limited to drinking only. Uses of the HPS for all the water needs were higher among urban slum households. But they too did not have more than 55 percent drawing the full requirement of water from the HPS.

Most known reasons for using water from the HPS were 'it prevents stomach disorder' and 'it prevents diarrhoea/cholera'. A small number of respondents were aware that water from the HPS might prevent other diseases as well. For example, only 29 percent of respondents in the urban slums and fringes knew that water from the HPS prevented skin diseases, while it was only 17.7 percent for those in the rural area. This explains why only a small proportion of households used the full requirement of water from the HPS.

Conditions of hand pump systems (HPSs)

Among HPSs in the rural area were 71 percent private HPSs and 29 percent public HPSs. In the urban slums and fringes, the ratio was 88 percent for private HPSs and 12 percent for public HPSs. Most of the enumerated HPSs in the survey were tubewells. Over 94 percent of the tubewells were found to be operating at the time of the survey both in the rural area and in the urban slums and fringes. There were, however, significant variations between the private and public tubewells. While only fewer than 5 percent of private tubewells were found non-operational at the time of the survey, the percentage was almost double for public tubewells in the rural area and about 3 times for those in the urban slums and fringes. With declining water table, some tubewells dry up and do not discharge water during the dry season. The problem starts with the Bangla month of Magh and continued until the end of Baishak. The number of affected HPSs peaked in Chaitra. Declining water table was a more serious problem in the low water table and stony areas than anywhere else.

Except for rural public tubewells, a substantial number had no platforms, over 42 percent among public tubewells in the urban slums and fringes, over 57 percent among private tubewells in the urban slums and fringes, and over 60 percent among those in rural areas. On the whole, platform conditions were also not adequate for public tubewells in the rural area, with only 70 percent of those having had the platform in good conditions. Among tubewells having platforms, a substantial number again had bad drainage systems resulting in pooling on the platform.

Only about 20 percent of caretakers of public tubewells in the rural area reported to have received some training about how to repair/maintain the tubewell. For the urban slums and fringes the percentage was slightly higher as 26 percent. Although, there was no programme to impart training to owners of private tubewells, a small 4 to 5 percent of them reported that they had training on the repair/maintenance work relating to tubewells.

Sanitation

Possession of latrines by households has risen significantly both in the rural areas and in the urban slums and fringes. In the rural area 61 percent of households now have latrines with 25.6 percent possessing a hygienic latrine. In the urban slums and fringes, proportions of households having latrines were even higher, with 83 percent possessing any type of latrine and 48 percent possessing a hygienic latrine.

Possession of latrines varied by socio-economic status of households. A household was much more likely to have a latrine if it was from higher socio-economic status than if it was from lower socio-economic status. For example, while only 54 percent of rural households with the family head having never attended school or having an education less than the primary level had the latrine, the percentage rose to 74 percent for those with the family head having completed primary education or more but less than the secondary level and then to over 83 percent for those having completed secondary education or above.

Among households having latrines, 91 percent of the respondents always used the latrine. About 8 percent of them sometime used it, while some (though fewer than one percent) never or rarely did it. On the overall, use of latrine by children still remains extremely low; fewer than 17 percent of respondents reported that children from their households used the latrine in the urban slums and fringes, while even fewer did in the rural area. Among boys the use of latrine was limited to only 41 percent of households in the rural area. Girls were much more likely to use the latrine. Girls were reported to be using latrines in 57 percent of households in the rural area and 87 percent in the urban slums and fringes. Adult males were much

less likely to use latrines than were adult females. While females used latrines in 64.5 percent of households in the rural area, the proportion was only 55 percent for males there. Similar variations were apparent in the urban slums and fringes. On the overall, people were less likely to use latrines in the rural area than in the urban slums and fringes.

Awareness of hygienic practices

Awareness of the relationship of tubewell water and sanitation with hygiene was found extremely low in the population although a significantly high percentage ascribed the benefits of tubewell water for health when interviewed in the context of tubewell. While asked about what a person need to follow to keep himself/herself healthy, only about three to four percent of respondents, both in the rural areas and in the urban slums and fringes, mentioned 'use tubewell water for all purposes'. Even 'drink tubewell water' was not mentioned by more than 16 percent among rural respondents and more than 30 percent among the urban slum and fringe respondents.

'Use latrine' was reported by only 6.6 percent among rural respondents and by only 11 percent among respondents in the urban slums and fringes. Spontaneous reporting of 'clean hands with soap or ash after defecation' was also not appreciable. Almost no respondent knew that indiscriminate defecation was a cause of worm infestation. Also, most respondents were found unaware that 'improper hand washing practices' and 'walking bare footed' may lead to worm infestation. Traditional beliefs that 'Taking of sugar/molasses causes worm infestation still persisted among over 8 out of every 10 women both in the rural area and in the urban slums and fringes.

Over 90 percent of respondents mentioned that they washed their hands after defecation, after cleaning up behind a child and before serving/taking foods. But it was only a small proportion found using soap in any case. For example, only 8.1 percent of rural women and 3.9 percent of women in the urban slums and fringes indicated that they used soap while washing their hand after defecation.

Impact of drinking water from the HPS was in clear evidence in the survey. Among children in every age group under 5 years of age in households using water from the HPS at least for drinking purposes, the prevalence of two week diarrhoeal disease was lower than among those in households not using water from the HPS for any purposes. Prevalence of diarrhoea among children had, however, no clear patterns of relationship to households' possession of latrines. A clear pattern of relation of the prevalence of diarrhoeal disease with hand washing practices was also not notable in the data.

Health communication

Until the time the survey was undertaken, there were no large scale communication campaigns undertaken to disseminate information/knowledge about the importance of tubewell water, hygienic latrines and hygienic practices. Nevertheless, when respondents were asked about if they had learnt anything from anyone about the importance of tubewell water, hygienic latrine and hand washing in the previous three months, 7.4 percent of rural respondents and about 11 percent of the urban slums and fringes respondents mentioned that they did. The more important finding was that a majority of those respondents mentioned health/family planning workers as a source of their awareness, thereby underscoring the importance of health/family planning workers as a major vehicle to disseminate any health related information in the target population. The potential of the school system was also quite evident. Data also showed that, household visitation by field workers was viewed by the respondents as a credible medium to disseminate knowledge/ information about the importance of tubewell water, hygienic latrines and hand washing practices in the population. Radio and television appeared as the next most important credible sources.

Chapter 1

INTRODUCTION

The National Survey on Status of Rural Water Supply and Sanitation was sponsored by the Department of Public Health Engineering (DPHE) and United Nations Children's Fund (UNICEF) to conduct a situation analysis pertaining to the water supply and sanitation sector in rural and slum areas of the country. Objectives of the survey, as specified in the Scope of Work, are listed below

1. For the water supply sector, the survey was designed to ascertain

   (i) accessibility and coverage levels of both Government and private tubewells (population per operating tubewell, access for drinking and other needs - to tubewells/other systems and time spent, by area, socio-economic group, and times of the year);

   (ii) conditions of existing tubewells (running, choked up, temporarily not working due to lack of repairs), conditions of platforms, water discharge levels, drainage systems;

   (iii) the chemical quality of water from the tubewell related to iron and chloride in terms of concentration level of acceptance in the specific problem areas;

   (iv) the quality and frequency of maintenance of tubewells and other systems (persons responsible for maintenance, extent of caretaker's training, availability of wrenches/kits).

   (v) extent of contributions made for installation of the tubewell. How much was paid for the maintenance during the last 3 months.

   (vi) Reasons of non-usage of safe water systems.

2. For the sanitation sector, the survey was designed to assess

   (i) the prevalence of latrines with respect to type, usage level, and socio-economic status of the respondents (water-sealed, septic tank, homemade, un-hygienic latrines, open defecation, etc.).

(ii) the cost of latrines by type, component (sub-structure) and source of purchase if applicable.

3. In order to provide data to design an appropriate communication strategy for the water and sanitation sector, the survey was also intended to investigate into the the following parameters:

(i) the use and source for water for different domestic needs;

(ii) levels of awareness of the relationship between water, sanitation, hygiene and diarrhoeal diseases;

(iii) perceived differences and benefits among different types of latrines;

(iv) sources of health-related information (friends, neighbours, health workers, schools radio, TV, etc.);

4. Also, the survey was intended to study the prevalence of water and excreta related diseases in the family by age and sex on the dates of survey. However, in the actual implementation of the survey, data were collected only on the prevalence of diarrhoeal diseases among children under 5 years of age, considering that it was difficult to ascertain, with retrospective questions, other water and excreta related diseases such as typhoid/para typhoid, hepatitis, worms infestation and skin diseases.

1.1 Survey universe

The survey universe covering the water supply and sanitation sector in the rural and urban slum areas was defined in terms of 7 strata based on hydrogeological classification of the country, namely, Shallow Water Table (SWT) areas, Low Water Table (LWT) areas, SWT/LWT areas, Coastal belt, Hilly regions, Stony regions and Urban slums (including fringes). Upazilas fully or almost fully consisting of SWTs were placed in the SWT stratum. Similarly, upazilas fully or almost fully consisting of LWTs were placed in the LWT stratum. The remaining upazilas containing both the shallow and the low water tables were allocated to the SWT/LWT stratum. The stony region stratum was constructed including all the upazilas belonging to that region. Similarly, the Coastal belt stratum and Hilly region stratum were constructed. The urban slum stratum was developed including all the pourasavas under the water supply and sanitation programme. **Appendix A** contains listing of upazilas by specific strata.

1.2. Samples

This section contains a brief presentation of the sample design of the survey. A more elaborate description of the design including its statistical basis is provided in **Appendix B.**

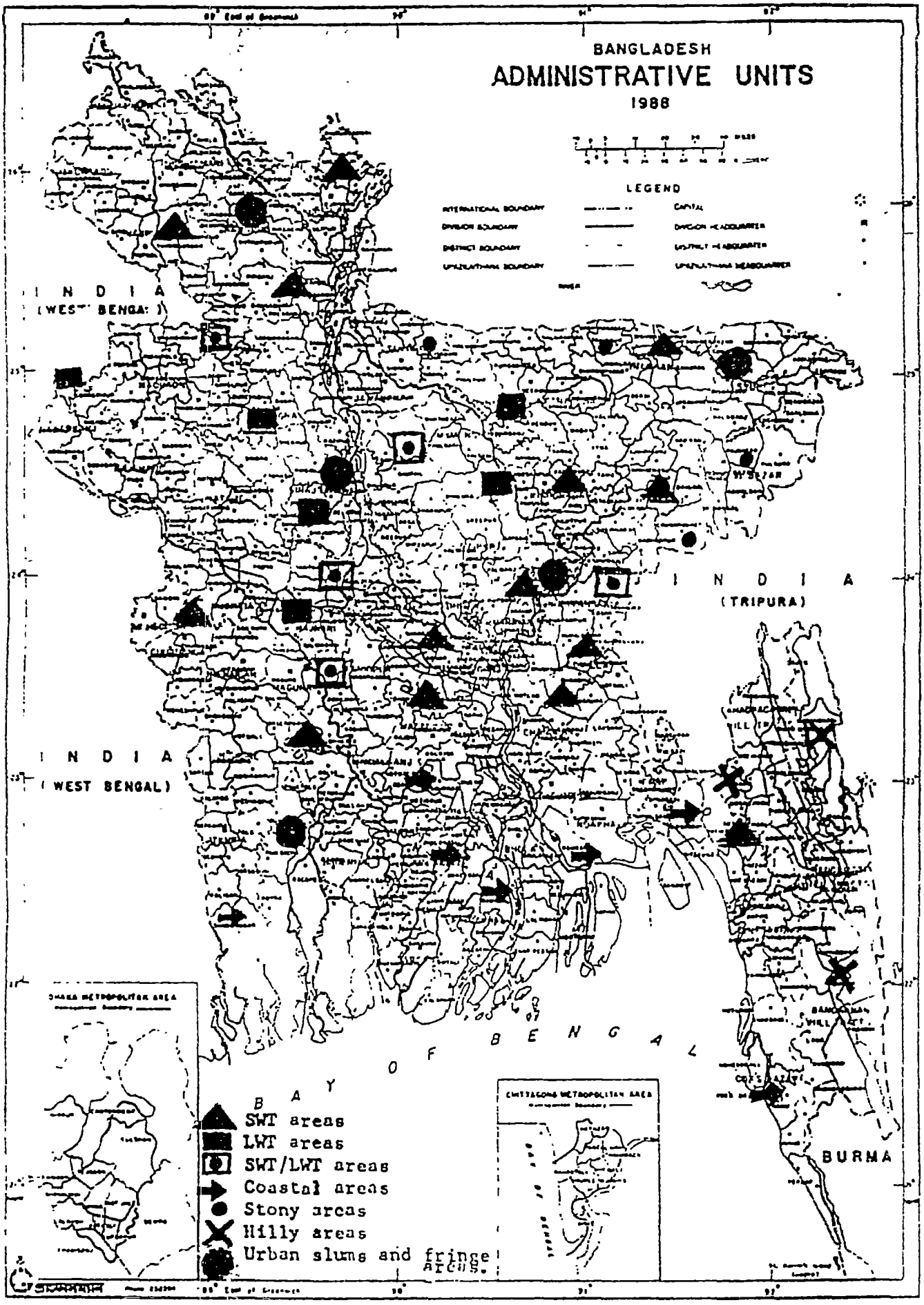
The survey samples were developed by randomly selecting 45 clusters of households from among the 7 strata, with 14 clusters included from the SWT stratum, 6 clusters from the LWT stratum, 5 clusters from the LWT/SWT stratum, 7 clusters from the coastal belt stratum, 5 clusters from the stony region stratum, 3 clusters from the hilly region stratum, and 5 clusters from the urban slum stratum (see table 1.1). Geographical spread of the selected clusters are displayed on the country map furnished on page 3A. **Appendix C** give the list of upazilas constituting the cluster sample.

Table 1.1

NUMBER OF SELECTED CLUSTERS BY STRATUM

Stratum	Number of upazila
Shallow Water Table (SWT) area	14
Low Water Table (LWT) area	6
LWT/SWT area	5
Coastal belt	7
Stony regions	5
Hilly regions	3
Urban slums (including fringes)	5
Total	45

A cluster usually included 450 to 550 households and comprised a village or part(s) of a village or some time, more than a village. In the urban slum area, a cluster was formed with artificially defined blocks. In each of the selected clusters, all hand pump systems and all households with complete counting of their usual household members were enumerated in a systematic fashion through house to house visits. This was done for three reasons. One, to assess the ratio of population to hand pump systems; two, to define the tubewell sample; three, to draw the household sample. The tubewell sample was used to obtain relevant data pertaining to conditions of hand pump systems, such as their operational status, maintenance standards, etc. Data from the household sample were gathered to develop the survey estimates pertaining to households and individual members, such as proportions of households having access to water from the hand pump system, proportions of households having latrines, proportion of respondents aware of benefits of drinking tubewell water, etc.


BANGLADESH
ADMINISTRATIVE UNITS
1988
LEGEND
INTERNATIONAL BOUNDARY
DIVISION BOUNDARY
DISTRICT BOUNDARY
UPAZILA/THANA BOUNDARY
CAPITAL
DIVISION HEADQUARTER
DISTRICT HEADQUARTER
UPAZILA/THANA HEADQUARTER
RIVER
I N D I A
(WEST BENGAL)
I N D I A
(TRIPURA)
I N D I A
(WEST BENGAL)
B A Y O F B E N G A L
BURMA
DHAKA METROPOLITAN AREA
CHITTAGONG METROPOLITAN AREA
SWT areas
LWT areas
SWT/LWT areas
Coastal areas
Stony areas
Hilly areas
Urban slums and fringe areas.

1.3. The tubewell sample

Table 1.2 shows the actual number (un-weighted) of hand pump systems, households and household members, as enumerated in the clusters, according to the strata. The tubewell sample was comprised of all 3,034 Hand Pump Systems (HPSs) enumerated in the sample. Of the 3034 hand pump systems, 904 were public systems and 2130 private systems. Data on conditions on the hand pump systems were gathered by visiting the site of each of the hand pump systems and interviewing their caretakers/owners. Results of the site visits, observations and interviewing were documented in a set of forms labeled as Tubewell Sample Forms (TSFs).

Table 1.2

THE NUMBER OF HOUSEHOLDS, HOUSEHOLD MEMBERS AND HAND PUMP SYSTEMS ACCORDING TO STRATA

Stratum	Actual sample				
	Households	Household members	Hand Pump Systems		
			Public	Private	Total
Shallow Water Table (SWT) Area	6460	36167	289	854	1143
Low Water Table (LWT) area	3151	16819	139	300	439
LWT/SWT area	2186	11358	112	292	404
Coastal belt	3366	20474	111	120	231
Stony regions	2078	11045	93	63	156
Hilly regions	1201	6997	94	20	114
Rural	18442	102860	838	1649	2487
Urban slums (including fringes)	2466	13103	66	481	547
Total	20908	115963	904	2130	3034

1.4. The households sample

The household sample was constructed, randomly selecting 100 households from each of the selected clusters. Table 1.3 shows the numbers of selected households and successfully interviewed households according to the strata. Out of the 45 clusters, interviews could not be undertaken in two clusters under Chittagong Hill Tracts of the hilly region. Data in the household sample were gathered by interviewing an ever married

woman(1) in each of the selected households. Women were chosen as respondents because it is they who usually draw the household's water, and therefore, it is their characteristics that should greatly determine the use of water from the hand pump system. Women were also considered more reliable provider of information as regards the other aspects of the survey.

Table 1.3

NUMBER OF HOUSEHOLDS SELECTED, FOUND AND SUCCESSFULLY INTERVIEWED ACCORDING TO STRATUM

Stratum	Actual sample		
	Households selected	Households found	Households completed
Shallow Water Table (SWT) area	1471	1341	1272
Low Water Table (LWT) area	626	571	537
LWT/SWT area	526	460	435
Coastal belt	737	668	629
Stony regions	532	478	459
Hilly regions	108	98	92
Rural	4000	3616	3428
Urban slums/fringe	520	454	425
Total	4520	4070	3853

1.5. Weighted samples

Samples were developed with differential rates of selections among and within different strata. Thus, appropriates weights had to be applied to observations from among clusters under specific strata to arrive at nationally representative estimates from the survey data. Table 1.4 shows the composition of the weighted household sample in terms of successfully interviewed households. Compositions of the weighted tubewell sample are described in table 2.1. The weight for the samples was determined as shown under.

(1) An ever married woman refers to a married woman regardless of whether she is past married or currently married. A currently married woman is a woman who still lives with her husband. A past married woman means she may be widowed, divorced, separated, or deserted.

(i) For the tubewell sample the weight was evaluated for jth cluster by

$$W_{ij} = \left(\frac{M_i}{m_{ij} \, k_i} \right) X \left(\frac{n}{M} \right)$$

(ii) For the household sample the weight was evaluated by

$$W_{ij} = \left(\frac{M_i}{n_{ij} \, k_i} \right) X \left(\frac{n}{M} \right)$$

where

M = the total number of households in the survey universe

m = the total number of listed households in the tubewell sample

n = the total number of households included in the household sample

M_i = the total number of households in the survey universe for the ith stratum

k_i = the number of clusters selected from ith stratum

m_{ij} = the number of listed households for jth clusters in the ith stratum

n_{ij} = the total number of households included in the household sample from the jth clusters of the ith stratum

Table 1.4

WEIGHTED NUMBER OF SUCCESSFULLY INTERVIEWED HOUSEHOLDS ACCORDING TO STRATUM

Stratum	Number of households
Shallow Water Table (SWT) area	1655
Low Water Table (LWT) area	660
LWT/SWT area	558
Coastal belt	716
Stony regions	134
Hilly regions	10
Rural	3734
Urban slums (including fringes)	120
Total	3854

1.6. The survey instruments

Three survey instruments were used in the survey, the household listing schedule, the tubewell sample form, and the household questionnaire. The household questionnaire had two parts - a household part and an individual part, the household part was used to conduct the census of the household by listing all its usual members with such information as the age, sex, marital status, etc. The household part was completed by interviewing any member of the household, who was capable to provide the desired information about the household. The instruments were developed by professional staff of Mitra and Associates, in collaboration with DPHE/UNICEF.

The survey instruments were pretested in some purposively selected areas. Pretesting was aimed at providing some idea of the length of the interview, feedback on the suitability of the questions, and flow of the sequence of questions. Pretesting was conducted with interviewers and supervisors, taken from among the regular staff of Mitra and Associates. The instruments were finalized based on the pretest results. The finalized instruments were adopted for use in the survey, with approval of DPHE/UNICEF. The instruments are enclosed as Appendix-D.

1.7. Field work

Field work in the survey was carried out at two levels. First level field work was devoted to household listing and enumeration of hand pump systems. The second level field work was devoted to collection of data from the household sample. Total field work of the survey was completed over a period of one month and a half from 11th December 1991 to 29th January 1992,

with the first level field work conducted over the time from 26th November to 28 the December 1991 and the second level field work done over the time from 11th December 1991 to 29th January 1992.

1.8. First level field work

Five teams of listers/enumerators were deployed to carryout the first level field work. Each team consisted of four members. All listers/enumerators were male. In addition to conducting the household listing and tubewell enumeration, they prepared a sketch map of the cluster, showing location of households on it. Listers/enumerators were supervised by two supervisors. Each enumerator/lister was provided with a iron kit and a chloride test kit. They were all trained about how to use these kits. The kits were provided by DPHE/UNICEF.

1.9. Second level field work

Eight interviewing teams were deployed to complete the second level field work. Each team had one male supervisor, one female supervisor, four female interviewers, and one male field logistical assistant. In addition, 3 quality control teams were employed in the survey. Each quality control team had two members, one male quality control officer and one female quality control officer. In their field checkings, quality control officers re-interviewed some of the respondents and check the accuracy of the sample. Some of the reported non-response cases were also checked to see if they were all really cases of non-response. A quality control officer verified/cross-checked the questionnaires/instruments completed by her/him with the corresponding questionnaires completed by the interviewers/ enumerators. Discrepancies, if any, found were corrected by undertaking actions as was necessary. The survey key personnel also made frequent field visits to ensure quality of the field work and hence the quality of the survey.

1.10. Data analysis

Data were processed and analyzed, using the facilities at Mitra and Associates. The data processing involved registration of instruments, editing/coding of information in the instruments, computerization of data. Computerization of data comprised several steps, such as (i) data entry into the computer file; (ii) checking of accuracy of data in the file; (iii) validation of data on the file by conducting consistency checks between interrelated variables; (iv) construction of working computer files to produce tables for preparation of the report; (v) merging all sub-files into one main file; and (vi) production of output tables from the cleaned data sets.

1.11. Organizational structure

Mitra and Associates, as the executive agency, was in the overall control of the survey. Total manpower employed in the survey are listed below:

Survey position	Number of Personnel
1. Project Director	1
2. Deputy Project Director	1
3. Research Officer	2
4. Quality Control Officer	6
5. Supervisor	16
6. Interviewer	32
7. Listing supervisor	2
8. Lister	20
9. Field Logistical Assistant	8
10. Registration Officer	1
11. Editor	10
12. Editing Verifier	10
13. Coder	25
14. Coding Verifier	25
15. Transcriber	2

1.12. Training of enumerators/interviewers/supervisors

Interviewers and enumerators were trained separately, ensuring that they learnt and acquired the skill needed to effectively carry out the survey work. First, enumerators' training was organized; then were the interviewers'. The training was conducted for two weeks for each of the groups. Training was imparted by the key personnel of the survey. Other senior professionals of Mitra and Associates also actively participated in the training. Also, technical personnel from the water, environment and sanitation (WES) section of UNICEF/Dhaka assisted in the training. Training methods comprised (i) class room lectures; (ii) demonstration interviews; (iii) role playing; (iv) field practices; (v) review of lessons learned; and (vi) discussions of problems and their suggested solutions.

1.13. Time schedule

Nov.01, 1991	Starting date
Nov.24, 1991	End training of listers/enumerators
Nov.26, 1991	Start households listings/enumeration of tubewells
Nov.30, 1991	Finalize interviewing schedule
Dec.09, 1991	End training of interviewers/pretest of interviewing schedule
Dec.11, 1991	Start data collection
Dec.28, 1991	End household listings/enumeration of tubewells
Jan.29, 1992	End data collection
Feb.22, 1992	End data processing
Feb.23, 1992	Draft report submission

1.14. Reporting

This report contains descriptions/interpretations of the major survey findings. It has 7 chapters: (1) Introduction, (2) Tubewell samples, (3) Coverages of, accessibility to and use of hand pump systems, (4) Sanitation situation, (5) Health awareness and hygienic practices, (6) Health communication, and (7) Summary.

Chapter 2

TUBEWELL SAMPLES

The major purposes of administering the tubewell sample were to assess: (i) availability of hand pump systems in the rural and urban slum areas of the country; (ii) relative availability of private hand pump systems compared to the public hand pump system, in the survey population; and (iii) status of hand pump systems in terms of operational conditions, conditions of platforms, drainage conditions, maintenance standards, etc.

2.1. Availability

As stated in table 1.2 of the earlier chapter, a total of 3,034 hand pump systems with a total of 115,963 household members were enumerated among 20,908 households in the sample, listing 2,487 hand pump systems with 102,360 household members among 18,442 households in the rural sample clusters, and 542 hand pump systems with 13,103 household members among 2,466 households in the urban slum/fringe clusters. Enumerated Hand Pump Systems(HPSs) included tubewells, Ringwells and Pond Sand Filters (PSFs). Hand pump systems, households and the household members were enumerated simultaneously in a cluster, listing them in a systematic fashion after clearly demarcating the boundaries of the cluster. A cluster usually included 450 to 550 households and comprised a village or part(s) of a village or more than a village. In the urban slum/fringe area, a cluster was formed with artificially defined blocks. As part of the enumeration work, a map was prepared for every cluster, showing its boundaries and the location of its households. More than one map was prepared for a cluster if it included more than one village/block, with one map done for every village/block. A specimen copy of the map is enclosed as Appendix E. All documents relating to the households' and hand pump systems' enumerations are available with the survey execution agency.

Shown in table 2.1 are weighted numbers of the enumerated hand pump systems (HPSs), households and households members for the weighted sample. The weighted number, for example, of enumerated hand pump systems for a specific stratum is the number of enumerated hand pump systems that the stratum would have, had the sample been developed covering the same proportion of population from every stratum. Estimates from the actual sample are likely to be biased, as it was subjected to over/under sampling for some strata compared to the others. Thus, all analyses presented in this report were done using the weighted sample.

Table 2.1

THE NUMBER OF HOUSEHOLDS, HOUSEHOLD MEMBERS AND HAND PUMP SYSTEMS (HPSs) IN THE WEIGHTED TUBEWELL SAMPLE

Strata	Weighted sample		
	Households	Households members	HPSs
Shallow Water Table (SWT) area	8939	50205	1637
Low Water TAble (LWT) area	3555	18975	509
Shallow/Low Water Table	3017	15768	561
Coastal belt	3870	23569	279
Stony region	731	3867	55
Hilly region	162	943	15
Rural	20274	113327	3056
Urban fringes	254	1294	98
Other slums	380	2077	43
Urban slums	634	3371	141
Total	20908	116701	3197

As shown in data of table 2.1, there was one hand pump system enumerated, on average, among 6.6 households or 37.7 persons, in the rural area. For the urban slums and fringes the ratio was 4.5 households or 23.9 persons per enumerated hand pump system. Availability of hand pump systems was found relatively much less in the hilly region, stony region and the coastal belt. More than 10 households or 60 persons had to be listed on average to enumerate one hand pump system in those strata, compared to fewer than, 7 households or 37 people in the other rural strata. Given ratios of households/people per enumerated hand pump systems should not, however, be construed as measures of coverage of hand pump systems in the survey population because coverage is likely to vary significantly between the public and private tubewells. Meaningful estimates of coverage are provided in section 3.1 of chapter 3.

2.2. Public versus private systems

Private hand pump systems out-numbered public hand pump systems, in the sample (see table 2.2). Among enumerated hand pump systems in the rural area were 71 percent private hand pump systems and 29 percent public hand pump systems. In the urban slums and fringes, the ratio was 88 percent for private hand pump systems and 12 percent for public hand pump systems. However, possession of private hand pump systems was much less frequent in the hilly regions and stony areas (see table 2.3). In those two rural strata, the safe water system still remained largely dependent on public hand pump systems. Only 16.1 percent of hand pump systems were private in the hilly regions, and 41 percent private in the stony areas.

Some respondents might have reported a public hand pump system as their own system. But, extent of such misreporting seemed to have no remarkable effects on the observed high proportions of private hand pump systems in the sample as explained in the subsequent paragraph.

Table 2.2

PERCENTAGE DISTRIBUTION OF HAND PUMP SYSTEMS BY PUBLIC/PRIVATE OWNERSHIP, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Ownership	Rural areas	Urban slums and fringes
Public	29.0	12.0
Private	71.0	88.0
Total	100.0	100.0
N(1)	3054a	142

(1) N is the weighted number of hand pump systems enumerated in the sample for a specific area, excluding the hand pump systems, if any, listed as NS (Not Stated) cases for information about the ownership.

(a) There was 1 hand pump system listed as an NS case in the sample for the rural area.

Table 2.3

PERCENTAGE DISTRIBUTION OF HAND PUMP SYSTEMS BY PUBLIC/PRIVATE OWNERSHIP, ACCORDING TO DIFFERENT STRATA

Ownership	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
Public	24.3	31.3	27.9	46.4	59.2	83.9	13.7	11.1
Private	75.7	68.7	72.1	53.6	40.8	16.1	86.3	88.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	1635a	509	561	279	55	15	43	99

(1) N is the weighted number of hand pump system enumerated in the sample for a specific stratum, excluding the hand pump system, if any, listed as NS (Not Stated) cases for information about the ownership.

(a) There was 2 hand pump systems listed as NS case in the sample for the Shallow Water Table (SWT) area.

While there were only about 800,000 public tubewells installed in the country by the time the survey was conducted, the survey estimate yields a total of 2,448,000 hand pump systems by that time, for the rural area only. The estimate of the total of 2,448,000 hand pump systems for the rural area was derived by applying the observed ratio of 37.7 rural people per enumerated hand pump system to 92.3 million population shown to be living in rural areas in the 1991 census(1). There were no data available to calculate the national population of the urban slums and fringes. This precludes deriving national estimates of hand pump systems for the urban slum and fringe areas.

There are no statistics showing the allocation of public tubewells between the rural and urban slum areas. But even if all of the 800,000 public tubewells are assumed to have been installed in the rural area, the proportion of public tubewells would not have been more than 32.7 percent in the rural sample. Thus, the reported proportion of 29.0 percent of public hand pump systems in the rural sample was subjected to under estimation by no more than 3.7 percentage points. Because of paucity of data,

(1) See Statistical Year Book 1991 of Bangladesh Bureau of Statistics.

underestimation of public hand pump systems in the urban slum and fringe sample cannot be ascertained. But, there too, it should not be of any remarkable magnitudes. Moreover, only a very small percentage of public tubewells were allocated to urban slums and fringes. areas.

2.3. Types of hand pump systems

Most hand pump systems were shallow tubewells. However, deep tubewells constituted about 12 percent of all public hand pump systems in the rural area (see table 2.4a). Although uses of ringwells were almost absent as public systems, they made up 4.4 percent of private hand pump systems in the rural area and 2.4 percent of those in the urban slums and fringes. Only one Pond Sand Filter (PSF) could be listed in the entire sample, which was a public system.

Most tubewells were found fitted with No.6 pump. The use of Tara pump remained limited to the rural area and mostly for the public system. In the rural area, the percentage of tubewells (both shallow and deep) fitted with Tara pump was 3.9 percent for public systems, while for private systems there the proportion was a negligible 0.7 percent. The use of No.4 pump was also noted among some tubewells in the sample for both the public and the private system.

Shallow tubewells fitted with No.6 pump constituted over 87 percent of the public hand pump systems and over 97 percent of the private hand pump systems, everywhere in the sample except for the coastal belt (see table 2.4b). In the coastal belt, deep tubewells fitted with No.6 pump were used as a major technology; there, 50 percent of all public tubewells were deep tubewells with No.6 pump compared to 46 percent for shallow tubewells fitted with No.6 pump. For private tubewells in the coastal belt, shallow tubewells fitted with No.4 pump were used in 20 percent cases, showing reduced dependence of private owners on shallow tubewells fitted with No.6 pump to about 77 percent there. As indicated earlier, shallow tubewells fitted with Tara were sunk usually by the government and mostly in the low water table area (13.1 percent) followed by hilly regions (7.7 percent). After coastal belt, deep tubewells fitted with No.6 pump were used in the shallow water table area and stony region. About 9 percent of all public tubewells in the shallow water table area and about 6.1 percent of those in the stony region were deep tubewells fitted with No.6 pump.

Table 2.4a

PERCENTAGE DISTRIBUTION OF HAND PUMP SYSTEMS (HPSs) ACCORDING TO THE TYPE AND THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of HPSs	Rural areas	Urban slums and fringes
Public		
Shallow tubewells	87.1	100.0
No.6	83.1	100.0
Tara	3.3	-
No.4	0.7	-
Deep tubewells	12.1	-
No.6	11.5	-
Tara	0.6	-
Ringwells	0.7	-
PSF	0.1	-
Total	100.0	100.0
N(1)	887	17
Private		
Shallow tubewells	94.1	96.0
No.6	92.1	96.0
Tara	0.6	-
No.4	1.4	-
Deep tubewells	1.5	1.6
No.6	1.4	1.6
Tara	0.1	-
Ringwells	4.4	2.4
Total	100.0	100.0
N(2)	2167	125

(1) N is the weighted number of public hand pump systems.

(2) N is the weighted number of private hand pump systems.

Table 2.4b

PERCENTAGE DISTRIBUTION OF HAND PUMP SYSTEMS (HPSs) ACCORDING TO THE TYPE AND THE PUBLIC AND PRIVATE CLASSIFICATION, BY STRATA

Type of HPSs	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
Public								
Shallow tubewells	89.9	99.4	99.4	50.0	87.9	69.2	100.0	100.0
No.6	89.9	86.3	96.2	44.5	84.9	61.5	100.0	100.0
Tara	-	13.1	3.2	0.8	3.0	7.7	-	-
No.4	-	-	-	4.7	-	-	-	-
Deep tubewells	10.0	-		50.0	9.1	-	-	-
No.6	9.1	-	-	50.0	6.1	-	-	-
Tara	1.0	-	-	-	3.0	-	-	-
Ringwells	-	0.6	0.6	-	3.0	23.1	-	-
PSF	-	-	-	-	-	7.7	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	397	160	156	128	33	13	6	11
Private								
Shallow tubewells	96.2	82.8	96.0	98.6	90.9	100.0	94.8	96.6
No.6	96.0	80.8	95.8	77.1	90.9	100.0	94.7	96.6
Tara	0.2	2.0	0.2	0.7	-	-	-	-
No.4	-	-	-	20.8	-	-	-	-
Deep tubewells	2.4	-	-	1.4	-	-	2.6	1.1
No.6	2.4	-	-	0.7	-	-	2.6	1.1
Tara	-	-	-	0.7	-	-	-	-
Ringwells	1.4	17.2	4.0	-	9.1	-	2.6	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(2)	1239	348	405	149	22	2	38	87

(1) N is the weighted number of public hand pump systems in the sample from a specific stratum.

(2) N is the weighted number of private hand pump systems in the sample from a specific stratum.

2.4. Conditions of tubewells

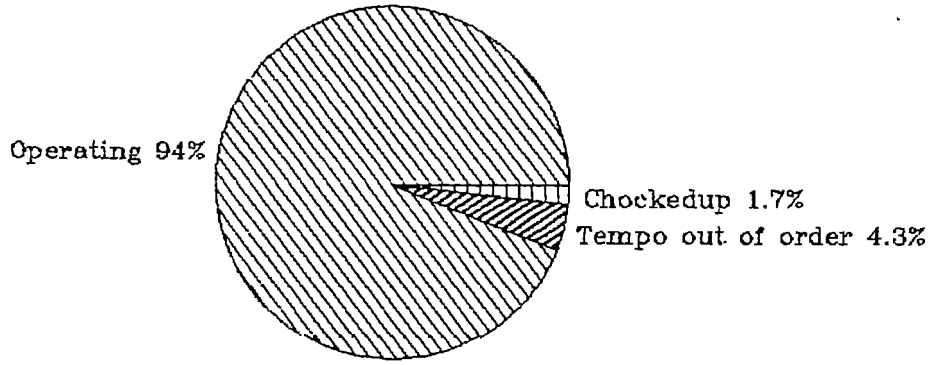
Over 94 percent of hand pump systems were found to be operating at the time of the survey anywhere in the sample (see figure 2.1). There were, however, significant variations between the private and public hand pump systems (see table 2.5a). While only fewer than 5 percent of private tubewells were found non-operational, the percentage was almost double for public tubewells in the rural area and about 3 times for those in the urban slums and fringes. Among the non-operational public tubewells in the urban slums and fringes, a substantial number was in chocked up conditions making up 12 percent of all public tubewells there. But, chocked up conditions were observed in fewer than 3 percent of public tubewells in the rural area and in even fewer among private tubewells anywhere.

Operational status of tubewells by type of technology is shown in table 2.5b. The sample included very small number of deep tubewells fitted with Tara pump. The sample was also very small for public shallow tubewells fitted with No.4 pump. The data of the table for these two categories of tubewells should, therefore, be treated with great caution. The urban slums and fringes employed almost no other technology except shallow tubewells with No.6 pump. Thus, the results of the table pertained wholly to the rural area.

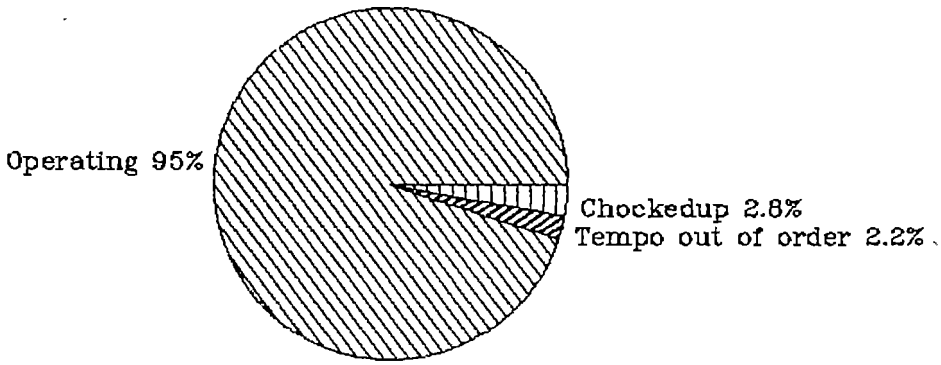
Hand pump systems, temporarily out of order were generally found among shallow tubewells. Few of the deep tubewells were coded as temporarily out of order. Among public shallow tubewells, 'temporarily out of order' conditions did not differ much by type of pump except for those fitted with No.4 pump. The exception should be treated with caution as it was based on observations of only six shallow tubewells fitted with No.4 pump. For private shallow tubewells, considerable variations were evident by type of pump. The number of hand pump systems temporarily out of order was 12.4 percent among private shallow tubewells fitted with Tara pump, while it was 8.3 percent for those fitted with No.4 pump and only 3.0 percent for those fitted with No.6 pump. Chocked up conditions of hand pump systems in the rural area were most frequently noticeable among public deep tubewells fitted with Tara pump and next most frequently among public shallow tubewells fitted with No.6 pump.

Figure 2.1

CONDITIONS OF TUBEWELLS IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES



RURAL AREAS



URBAN SLUMS AND FRINGES

Source:Water & Sanitation survey 1992

Table 2.5a

PERCENTAGE DISTRIBUTION OF TUBEWELLS(1) BY OPERATIONAL STATUS ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of tubewells/operational status	Rural areas	Urban slums and fringes
Public		
Operating	90.0	85.0
Temporarily out of order	7.2	3.0
Chockedup	2.8	12.0
Total	100.0	100.0
N(2)	881	17
Private		
Operating	95.7	97.5
Temporarily out of order	3.1	1.3
Chockedup	1.2	1.2
Total	100.0	100.0
N(3)	2072	122

(1) Ringwells are excluded from the distribution.

(2) N is the weighted number of public tubewells in a specific sample, excluding public ringwells.

(3) N is the weighted number of private tubewells in a specific sample, excluding private ringwells.

Table 2.5b

PERCENTAGE DISTRIBUTION OF TUBEWELLS(1) BY OPERATIONAL STATUS ACCORDING TO THE TYPE AND THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of tubewells/operational status	Rural areas	Urban slums and fringes
	Public	
Shallow fitted with No.6		
Operating	90.4	84.7
Temporarily out of order	7.6	3.1
Chockedup	2.0	12.2
Total	100.0	100.0
N(2)	737	17
Shallow fitted with Tara		
Operating	91.1	-
Temporarily out of order	8.4	-
Chockedup	0.5	-
Total	100.0	-
N(2)	29	
Shallow fitted with No.4		
Operating	60.0	-
Temporarily out of order	40.0	-
Chockedup	-	-
Total	100.0	-
N(2)	6	
Deep fitted with No.6		
Operating	88.6	-
Temporarily out of order	2.1	-
Chockedup	9.3	-
Total	100.0	-
N(2)	102	
Deep fitted with Tara		
Operating	100.0	-
Temporarily out of order	-	-
Chockedup	-	-
Total	100.0	-
N(2)	5	

contd...

Table 2.5b (contd.)

Type of tubewells/operational status	Rural areas	Urban slums and fringes
	Private	
Shallow fitted with No.6		
Operating	95.7	97.4
Temporarily out of order	3.0	1.3
Chockedup	1.3	1.3
Total	100.0	100.0
N(3)	1995	120
Shallow fitted with Tara		
Operating	87.6	-
Temporarily out of order	12.4	-
Chockedup	-	-
Total	100.0	-
N(3)	13	
Shallow fitted with No.4		
Operating	91.7	-
Temporarily out of order	8.3	-
Chockedup	-	-
Total	100.0	-
N(3)	30	
Deep fitted with No.6		
Operating	99.5	100.0
Temporarily out of order	0.5	-
Chockedup	-	-
Total	100.0	100.0
N(3)	31	1
Deep fitted with Tara		
Operating	100.0	-
Temporarily out of order	-	-
Chockedup	-	-
Total	100.0	-
N(3)	1	

(1) Ringwells are excluded from the distribution.

(2) N is the weighted number of public tubewells in a specific category, excluding public ringwells.

(3) N is the weighted number of private tubewells in a specific category, excluding private ringwells.

2.5. Effects of declining water table

While water tables decline, some tubewells dry up and do not discharge water (see table 2.6a). The problem starts with the Bangla month of Magh and continued until the end of Baishak. The number of affected hand pump systems peaked in Chaitra. All affected hand pump systems revert to their normal operational status after Baishak. Relatively more hand pump systems become non-functional in the rural area than in the urban slums and fringes. When in the peak month of Chaitra 8.0 percent of public hand pump systems in the rural area became non-functional due to declines in water tables, the percentage was only 3.5 percent for public hand pump systems in the urban slums and fringes. Similar variations were in evidence between the two areas for private hand pump systems.

Table 2.6a

PERCENTAGE OF OPERATING TUBEWELLS THAT REMAIN NON-FUNCTIONAL DUE TO DECLINING WATER TABLES IN A SPECIFIC MONTH OF THE YEAR ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Bengali months (English months)	Rural areas	Urban slums and fringes
	Public	
Magh(Mid Jan.-Mid Feb.)	0.6	3.5
Falgoon(Mid Feb.-Mid Mar.)	2.8	3.5
Chaitra(Mid Mar.-Mid Apr.)	8.0	3.5
Baishak(Mid Apr.-Mid May)	5.4	1.8
N(1)	793	14
	Private	
Magh(Mid Jan.-Mid Feb.)	0.4	0.4
Falgoon(Mid Feb.-Mid Mar)	1.3	0.9
Chaitra(Mid Mar.-Mid Apr.)	7.0	2.2
Baishak(Mid Apr.-Mid May)	5.8	1.1
N(2)	1982a	119

(1) N is the total weighted number of operating public tubewells in a specific area, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in a specific area, excluding private ringwells.

(a) The number of NS (Not Stated) cases was 4 for private tubewells in the rural area.

Declining water table was a more serious problem in the low water table and stony areas than anywhere else (see table 2.6b). However, private hand pump systems were found, relatively, more affected in the stony area than in the low water table area, while the reversal was true for the public hand pump system. Note that, in the low table area, the percentage of public tubewells affected by lowering of the water table was about twice that for private tubewells. There were no data collected in the survey that could be used to explain the differences between the public and the private systems. In efforts to improve the public water supply system, future studies may investigate into the underlying reasons of the differences.

Table 2.6b

PERCENTAGE OF OPERATING TUBEWELLS THAT REMAIN NON-FUNCTIONAL DUE TO DECLINING WATER TABLES IN A SPECIFIC MONTH OF THE YEAR IN THE RURAL AREA ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, BY STRATA

Bengali months(English months)	Strata					
	SWT	LWT	SWT/LWT	Coastal	Stony	Hilly
Public						
Magh(Mid Jan.-Mid Feb.)	-	1.6	-	-	7.7	-
Falgoon(Mid Feb.-Mid Mar)	-	12.6	0.8	-	12.8	-
Chaitra(Mid Mar.-Mid Apr.)	5.5	27.4	0.8	-	15.4	2.0
Baishak(Mid Apr.-Mid May)	5.5	16.1	-	-	1.3	-
N(1)	358	140	148	112	28	7
Private						
Magh(Mid Jan.-Mid Feb.)	0.1	0.8	-	-	24.1	-
Falgoon(Mid Feb.-Mid Mar)	0.1	5.6	0.3	-	26.0	-
Chaitra(Mid Mar.-Mid Apr.)	8.2	12.7	0.7	-	29.6	-
Baishak(Mid Apr.-Mid May)	8.0	7.9	-	-	7.4	-
N(2)	1169	272	378	141	19	2

(1) N is the total weighted number of operating public tubewells in a specific stratum, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in a specific stratum, excluding private ringwells.

(a) The number of NS (Not Stated) cases was 4 for private tubewells in the rural area.

2.7. Maintenance

Except for rural public tubewells, a substantial number had no platforms, over 42 percent among public tubewells in the urban slum, and over, 57 percent and 60 percent respectively among private tubewells in the urban slum and rural areas (see table 2.7a). On the whole, platform conditions were also not adequate for public tubewells in the rural area, with only 70 percent of those having the platform in good conditions. Among public tubewells, platform conditions were found best for Tara tubewells and next best for Deep tubewells (see table 2.7b). In contrast, private tubewells were found to have had worst platform conditions for Tara tubewells and best for Deep tubewells.

Table 2.7a

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS BY PLATFORM CONDITIONS ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Platform conditions	Rural areas	Urban slums and fringes
	Public	
Good	69.7	42.9
Damaged	13.0	14.2
Not existing	17.3	42.9
Total	100.0	100.0
N(1)	793	14
	Private	
Good	36.4	38.8
Damaged	2.8	4.0
Not existing	60.8	57.2
Total	100.0	100.0
N(2)	1978a	119

(1) N is the total weighted number of operating public tubewells in a specific sample, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in a specific sample, excluding private ringwells.

(a) The number of NS (Not Stated) cases was 4 for private tubewells in the rural area.

Table 2.7b

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS BY PLATFORM CONDITIONS ACCORDING TO THE TYPE AND THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type/platform conditions	Rural areas	Urban slums and fringes
	Public	
Shallow tubewell		
Good	66.6	44.9
Damaged	15.2	11.0
Not existing	18.2	44.1
Total	100.0	100.0
N(1)	670	14
Deep tubewell		
Good	82.4	-
Damaged	2.2	-
Not existing	15.4	-
Total	100.0	-
N(1)	91	
Tara		
Good	95.2	-
Damaged	-	-
Not existing	4.8	-
Total	100.0	-
N(1)	31	

contd...

Table 2.7b (contd.)

Type/platform conditions	Rural areas	Urban slums and fringes
	Private	
Shallow tubewell		
Good	36.0	38.9
Damaged	2.7	4.0
Not existing	61.3	57.1
Total	100.0	100.0
N(2)	1935	117
Deep tubewell		
Good	73.2	50.0
Damaged	8.7	-
Not existing	18.1	50.0
Total	100.0	100.0
N(2)	31	2
Tara tubewell		
Good	9.1	-
Damaged	-	-
Not existing	90.9	-
Total	100.0	-
N(2)	11	

(1) N is the total weighted number of operating public tubewells in a specific category, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in a specific category, excluding private ringwells.

Among tubewells having platforms, a substantial number again had bad drainage system resulting in pooling on the platform (see table 2.8a). Bad drainage systems were relatively more frequently observed among public tubewells than among private tubewells. However, among the public tubewells the drainage system was found best for Tara tubewells and worst for shallow tubewells (see table 2.8b).

Table 2.8a

PERCENTAGE DISTRIBUTION OF TUBEWELLS BY DRAINAGE SYSTEM OF TUBEWELLS ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type/drainage system	Rural areas	Urban slums and fringes
	Public	
No pooling	82.3	77.0
Pooling	17.7	23.0
Total	100.0	100.0
N(1)	156	8
	Private	
No pooling	90.2	88.2
Pooling	9.8	11.8
Total	100.0	100.0
N(2)	775	51

(1) N is the weighted number of public tubewells in a specific sample, having platforms.

(2) N is the weighted number of private tubewells in a specific sample, having platforms.

Out of every 10 rural public tubewells, about 4 tubewells each had at least one part missing at the time of the survey (see table 2.9a). Proportions with missing parts were, however, relatively fewer among private tubewells compared to public tubewells, and among tubewells in the urban slums and fringes, compared to the rural area. Nut bolts holding the different components of the tubewells were the most frequently missing parts everywhere regardless of private or public tubewells, both in the rural areas and urban slums and fringes.

Table 2.8b

PERCENTAGE DISTRIBUTION OF TUBEWELLS BY DRAINAGE SYSTEM OF TUBEWELLS ACCORDING TO THE TYPE AND THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type/drainage system	Rural areas	Urban slums and fringes
Public		
Shallow tubewell		
No pooling	81.4	77.0
Pooling	18.6	23.0
Total	100.0	100.0
N(1)	547	8
Deep tubewell		
No pooling	86.8	-
Pooling	13.2	-
Total	100.0	-
N(1)	77	
Tara tubewell		
No pooling	95.5	-
Pooling	4.5	-
Total	100.0	-
N(1)	30	

contd...

Table 2.8b (contd.

Type/drainage system	Rural areas	Urban slums and fringes
	Private	
Shallow tubewell		
No pooling	90.3	88.1
Pooling	9.7	11.9
Total	100.0	100.0
N(2)	749	50
Deep tubewell		
No pooling	89.4	100.0
Pooling	10.6	-
Total	100.0	100.0
N(2)	26	1
Tara tubewell		
No pooling	100.0	-
Pooling	-	-
Total	100.0	-
N(2)	1	

(1) N is the weighted number of public tubewells in a specific category, having platforms.

(2) N is the weighted number of private tubewells in a specific category, having platforms.

There were also many tubewells having broken parts (see table 2.9b). About 20 percent of rural public tubewells had at least one part broken at the time of the survey. Percentages with broken parts were even slightly higher for rural private tubewells. On the overall, parts were found more likely to be broken among tubewells in the urban slums and fringes, compared to the rural area. Among the most frequently observed broken parts were bucket/washer and nut bolts.

Table 2.9a

PERCENTAGE OF OPERATING TUBEWELLS HAVING SPECIFIC PART MISSING ACCORDING TO THE PUBLIC/PRIVATE OWNERSHIP, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Ownership	Rural areas	Urban slums and fringes
Public		
Pump	0.0	0.0
Handle	0.7	5.4
Head cover	0.1	-
Nut	1.2	-
Nut bolt	31.7	21.2
Head pin/Nose pin/Rod pin	14.9	12.4
Falcran pin	5.9	1.8
Piston (rod)	-	1.8
Bucket/Washer	0.5	-
Check bulb	0.3	-
Others	0.2	-
No parts missing	57.4	71.6
N(1)	793	14
Private		
Pump	0.0	0.2
Handle	0.6	0.2
Head	0.2	0.4
Nut	1.4	1.9
Nut bolt	18.2	8.9
Head pin/Nose pin/Rod pin	6.5	2.2
Falcran pin	2.3	0.4
Piston (rod)	-	-
Bucket/Washer	0.3	4.4
Check bulb	0.4	1.6
Others	0.1	0.4
No parts missing	73.0	81.7
N(2)	1981	119

(1) N is the total weighted number of operating public tubewells in the sample for a specific area, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in the specific sample for a specific area, excluding private ringwells.

Table 2.9b

PERCENTAGE OF OPERATING TUBEWELLS HAVING SPECIFIC PART BROKEN ACCORDING TO THE PUBLIC/PRIVATE OWNERSHIP, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Parts broken	Rural areas	Urban slums and fringes
Public		
Handle	2.6	1.8
Head cover	0.6	0.0
Head	0.5	0.0
Nut bolt	5.3	20.1
Head pin/Nose pin/Rod pin	3.2	3.6
Falcran pin	2.2	-
Piston rod	1.3	9.1
Piston assembly	0.2	3.7
Plunger	2.2	1.8
Bucket/Washer	8.5	20.1
Check bulb	4.0	3.7
Pipe/PVC pipe	0.6	1.7
Filter/Straner	0.2	-
G.I. pipe	0.2	-
Others	0.8	-
No parts broken	80.0	69.1
N(1)	793	14
Private		
Handle	1.0	1.1
Head cover	0.6	0.2
Head	0.3	0.9
Nut bolt	4.9	16.1
Head pin/Nose pin/Rod pin	2.8	3.7
Falcran pin	0.7	0.7
Piston rod	0.8	3.5
Piston assembly	0.1	0.0
Plunger	3.5	2.7
Bucket/Washer	11.7	22.8
Check bulb	9.2	10.4
Pipe/PVC pipe	0.6	0.7
Filter/Straner	1.2	1.3
G.I. pipe	0.1	-
Others	0.5	-
No parts broken	77.9	64.8
N(2)	1982	119

(1) N is the total weighted number of operating public tubewells in the sample for a specific area, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in the specific sample for a specific area, excluding private ringwells.

Only about 20 percent of caretakers for public tubewells in the rural area reported to have received some training about how to repair/maintain the tubewell (see table 2.10). For the urban slums and fringes, the percentage was slightly higher as 26 percent. Although, there was no programme to impart training to owners of private tubewells, a small 4 to 5 percent of them reported that they had training on the repair/maintenance work relating to tubewells.

Table 2.10

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS BY TRAINING STATUS OF THEIR CARETAKERS ACCORDING TO THE PUBLIC/PRIVATE OWNERSHIP, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Training status of caretakers	Rural areas	Urban slums and fringes
	Public	
Trained	19.5	26.1
Not trained	80.5	73.9
Total	100.0	100.0
N(1)	793	14
	Private	
Trained	4.8	4.2
Not trained	95.2	95.8
Total	100.0	100.0
N(2)	1981a	119

(1) N is the weighted number of operating public tubewells in sample for a specific area, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in sample for a specific area, excluding private ringwells.

(a) The number of NS (Not Stated) cases was 1 for private tubewells and 1 for public tubewells in rural area.

For public tubewells fitted with No.6 or No.4 pump, only 28.6 percent of the caretakers had wrenches available with them in the rural area (see table 2.11a). Availability of wrenches was even lower among caretakers for the public tubewells in the urban slums and fringes. Wrenches were also not available with more than 22 percent of owners of private tubewells fitted with No.6 or No.4 pump in the either area. For public tubewells fitted with Tara pump, kits were available with more than 50 percent of the caretakers. But for private tubewells fitted with Tara pump the figure was only 9.5 percent.

Table 2.11a

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS FITTED WITH NO.6 OR NO.4 PUMP BY AVAILABILITY OF WRENCHES WITH CARETAKERS/OWNERS ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of pump/availability of wrenches	Rural areas	Urban slums and fringes
	Public	
No.6		
Available	28.6	19.4
Not available	71.4	80.6
Total	100.0	100.0
N(1)	756	14
No.4		
Available	-	-
Not available	100.0	-
Total	100.0	-
N(1)	4	
	Private	
No.6		
Available	20.6	22.0
Not available	79.4	78.0
Total	100.0	100.0
N(2)	1940	118
No.4		
Available	22.7	-
Not available	77.3	-
Total	100.0	-
N(2)	28	

(1) N is the weighted number of operating public tubewells fitted with No.6 or No.4 pump in the sample for a specific area.

(2) N is the weighted number of operating private tubewells fitted with No.6 or No.4 pump in the sample for a specific area.

Table 2.11b

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS FITTED WITH TARA PUMP BY AVAILABILITY OF KITS WITH CARETAKERS/ OWNERS ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Availability of kits	Rural areas	Urban slums and fringes
Public		
Available	52.6	-
Not available	47.4	-
Total	100.0	-
N(1)	31	
Private		
Available	9.5	-
Not available	90.5	-
Total	100.0	-
N(2)	12	

(1) N is the weighted number of operating public tubewells fitted with Tara pump in the sample for a specific area.

(2) N is the weighted number of operating private tubewells fitted with Tara pump in the sample for a specific area.

Although no wrenches/kits were available with the majority of caretakers/owners, about 50 percent of them claimed to have repaired their tubewells themselves at the last break down (see table 2.12). But, in a substantial number of cases, the repair work at the last break down was done with a hired mistree. The DPHE mechanic's services for the repair work were reported for no more than 10 percent of public tubewells in the rural area and for no more than 7 percent of those tubewells in the urban slums and fringes.

Table 2.12

CATEGORY OF PERSONS WHO REPAIRED THE TUBEWELLS DURING THE LAST BREAKDOWN BY OWNERSHIP OF TUBEWELLS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Persons who repaired	Rural areas	Urban slums and fringes
	Public	
Hired mistree	21.8	20.0
DPHE mechanic	9.7	6.7
Care-taker/users	50.1	60.0
Others	1.5	-
No breakdown since installation	16.9	13.3
Total	100.0	100.0
N(1)	793	14
	Private	
Hired mistree	27.4	32.9
DPHE mechanic	3.0	-
Care-taker/users	51.9	42.4
Others	0.8	0.6
No breakdown since installation	16.9	24.1
Total	100.0	100.0
N(2)	1982	119

(1) N is the weighted number of operating public tubewells in the sample for a specific area, excluding public ringwells.

(2) N is the weighted number of operating private tubewells in the sample for a specific area, excluding private ringwells.

2.8 Chemical quality of water

Chemical quality of water from the tubewell, in terms of iron concentration is shown in table 2.13 and that for chloride concentration in table 2.14. For majority of the tubewells, iron concentration in the water was observed within acceptable level of 5 PPM everywhere except in the hilly region. In the hilly

region, only 22.7 percent of the tubewells were found to be discharging water with iron concentration within the acceptable level of 5 PPM, while the corresponding percentages in the other strata were 57 percent for the shallow and low water table stratum, 66.5 percent for the stony area stratum, and 70 percent or over for the remaining strata.

Except in the coastal belt, chloride concentration in the water was found within acceptable level of 600 Mg/L, universally/or almost universally among tubewells anywhere in the sample. The proportion of tubewells showing chloride concentration (at 600 Mg/L or above) above the acceptable level, was about 25 percent in the coastal belt.

Table 2.13

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS ACCORDING TO IRON CONCENTRATION IN THE WATER, BY STRATA

Iron contraception (in PPM)	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
0 - 4	70.0	86.0	57.3	96.3	66.5	22.7	79.8	95.7
5 - 9	20.0	9.7	20.9	2.0	16.5	66.8	9.2	2.7
10 - 14	7.0	3.3	19.2	1.7	4.3	7.3	5.5	0.8
15 +	3.0	1.0	2.6	-	12.7	3.2	5.5	0.8
Total	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
N(1)	1360	315	395	251	48	9	28	67
Mean	4.36	2.11	5.55	1.82	5.46	7.03	3.57	2.20

(1) N is the number of tubewells in a specific stratum, on which the observation was made.

Table 2.14

PERCENTAGE DISTRIBUTION OF OPERATING TUBEWELLS ACCORDING TO CHLORIDE CONCENTRATION IN THE WATER, BY STRATA

Chloride concentration i(in Mg/L)	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
0 - 599	95.2	100.0	100.0	74.7	-	100.0	100.0	96.4
600 - 1000	1.8	-	-	15.5	-	-	-	1.8
1000 +	3.0	-	-	9.8	-	-	-	1.8
Total	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0
N(1)	897	52	270	251		9	8	28
Mean	153.1	126.3	95.3	372.0	-	59.1	137.4	173.2

(1) N is the number of tubewells in a specific stratum, on which the observation was made.

Chapter 3

COVERAGE OF, ACCESSIBILITY TO AND USE OF HAND PUMP SYSTEM

Availability of the hand pump system(HPS) in a locality is a precondition to make safe water available to people in the locality. But, mere availability does not imply that people would have access to the system and would use water from it. Success of the water supply programme would depend greatly on the system's service coverage, accessibility of people to the system, and the extent people do use water from it. This chapter presents the survey findings from the household sample as regards to: access to hand pump systems(HPSs) in terms of households using them; number of households/people served by a HPS, accessibility of households to HPSs in terms of their location, distance and the time required to obtain water from them; the extent water is used by households from HPSs; and users' satisfaction in using water from them. The chapter also contains analysis of awareness about benefits of using water from the hand pump system. Unless people are aware of the benefits, they are unlikely to make full utilization of the system even if they have easy accessibility to it.

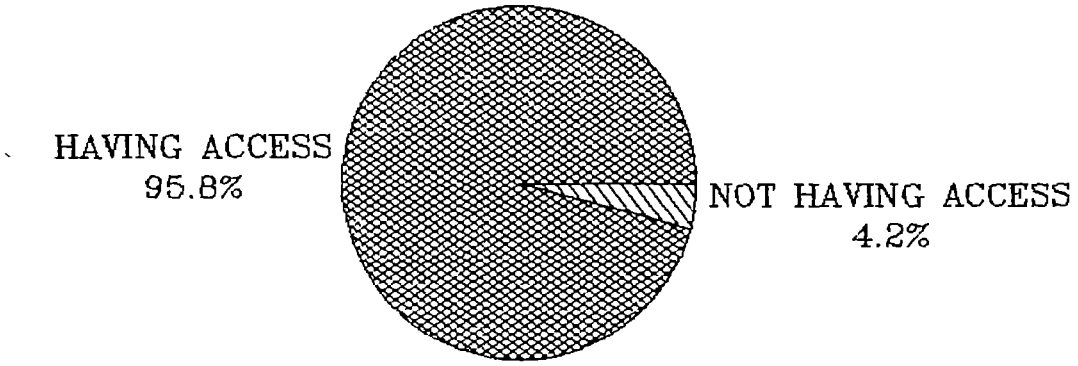
3.1. Access

In Bangladesh, most households in rural areas and in the urban slums and fringes, now, have access to the hand pump system, for drinking water and other domestic purposes (see figure 3.1). When questioned about usual sources of their households' drinking water, 96 percent of respondents mentioned the hand pump system in the rural area; 94 percent in the urban slums and fringes. However, the percentage of households having access to the hand pump system still remained considerly lower at 85 percent in the coastal belt and 88 percent in the hilly regions, while it reached almost 100 percent elsewhere in the survey population (see table 3.1b).

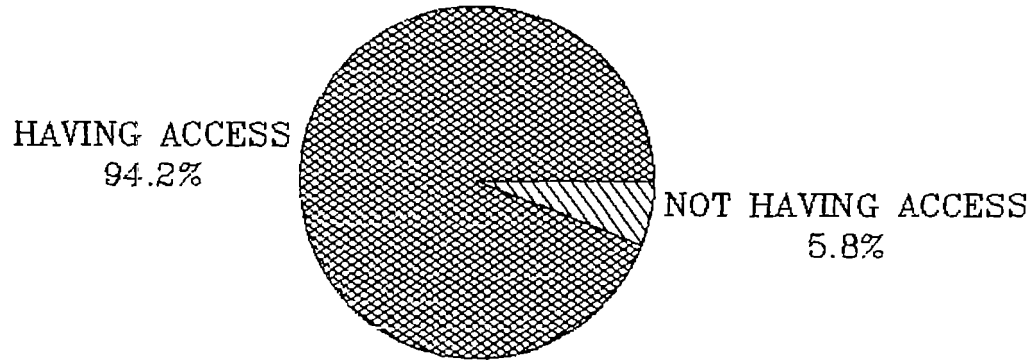
Most widely used hand pump systems were shallow tubewells covering 77 percent of households in the rural area and 88 percent in the urban slums and fringes (see table 3.1a). But, deep tubewells were a more used technology in the coastal belt (see table 3.1b). There, 46 percent of households reported obtaining water from deep tubewells, compared to 32.3 percent for the shallow tubewells. Tara tubewells were yet to achieve a discernible proportion of use, except in the hilly regions (10 percent) and low water tables areas (5 percent). Although coverage of ringwells appeared low in the overall sample, they were a chief source of water for the hilly regions (50 percent) and stony areas (23.3 percent).

Figure 3.1

ACCESS TO HAND PUMP SYSTEMS IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES



RURAL AREAS



URBAN SLUMS AND FRINGES

SOURCE:NATIONAL WATER/SANITATION SURVEY–1991

Along with the government's distribution of tubewells, sinking of private tubewells had a significant contribution in making the system universally accessible to people across rural areas and the urban slums and fringes (see figure 3.2). In the rural area, private hand pump systems (49.2 percent) had almost equal coverages in terms of access as had public had pump systems (50.8 percent). In the urban slums and fringes, coverage of the private had pump system was even more pronounced, with three out of every four user-households there depending on it. Among the rural strata, private hand pump systems had the highest coverage of access in the shallow water table area, while the public system had it in the coastal belt (see table 3.1c).

Table 3.1a

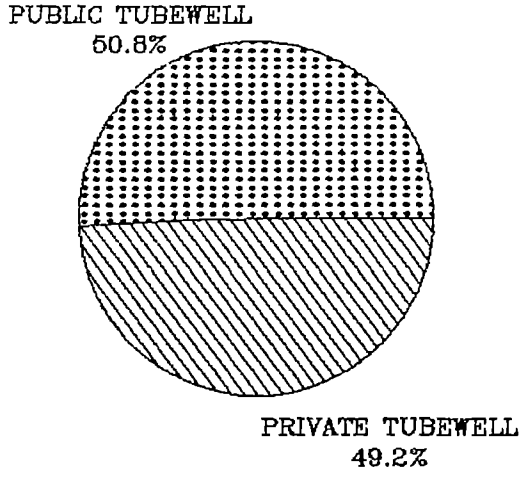
PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY USUAL SOURCES OF DRINKING WATER, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Usual sources of drinking water	Rural areas	Urban slums and fringes
Hand pump systems	95.8	94.2
Shallow tubewell(drinking water)	77.2	88.3
Deep tubewell(drinking water)	11.7	3.3
Tara tubewell	1.7	0.8
Shallow tubewell(agriculture)	0.3	-
Deep tubewell(agriculture)	0.3	-
PSF (pond sand filter)	0.8	-
Ringwell	3.9	1.7
Others	4.2	5.8
River	0.6	-
Pond	3.3	-
Chara	0.0	-
Canal	0.1	-
Others	0.2	5.8
Total	100.0	100.0
N(1)	3734	120

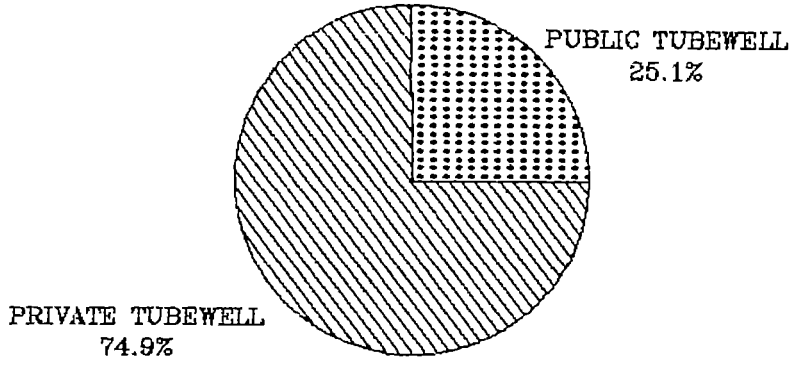
(1) N is the total weighted number of households in the sample from a specific area.

Figure 3.2

PUBLIC VERSUS PRIVATE HANDPUMP COVERAGE IN RURAL AREAS AND THE URBAN SLUMS AND AND FRINGES



RURAL AREAS



URBAN SLUMS AND FRINGES

SOURCE:WATER/SANITATION SURVEY-1991

Table 3.1b

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY USUAL SOURCES OF DRINKING WATER, ACCORDING TO SPECIFIC STRATA

Usual sources of drinking water	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
Hand pump system	98.0	99.7	99.6	85.8	88.0	100.0	89.7	99.4
Shallow tubewell (drinking water)	90.2	86.1	91.3	32.3	57.7	40.0	83.6	94.4
Deep tubewell (drinking water)	5.8	-	0.5	46.2	4.4	-	5.3	1.5
Tara tubewell	1.0	5.4	0.4	0.5	2.6	10.0	-	0.6
Shallow tubewell (agriculture)	0.1	0.8	0.7	-	-	-	-	-
Deep tubewell (agriculture)	-	-	-	1.9	-	-	-	-
PSF (pond sand filter)	-	-	-	4.2	-	-	-	-
Ringwell	1.0	7.3	6.7	0.8	23.3	50.0	0.8	2.9
Others	2.0	0.3	0.4	14.2	12.0	-	10.3	0.6
River	0.9	-	-	0.2	3.9	-	-	-
Pond	0.8	0.2	0.2	13.4	6.0	-	-	-
Chara	-	-	-	-	-	-	-	-
Canel	-	-	-	0.5	-	-	-	-
Others	0.2	0.2	0.2	-	2.1	-	10.3	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	1655	660	558	716	134	10	63	56

(1) N is the weighted number of households in the sample from a specific stratum.

Among households using private hand pump systems, about one third used their own systems in both the rural and urban slum areas (see table 3.1d). In the rural area, another 15 percent owned their hand pump system in partnership with others. But in the urban slums and fringes, proportions owning hand pump systems in partnership with others were fewer than 5 percent.

Table 3.1c

PERCENTAGE OF HOUSEHOLDS OBTAINING WATER FROM PUBLIC HAND PUMP SYSTEMS COMPARED TO PRIVATE HAND PUMP SYSTEMS, ACCORDING TO SPECIFIC STRATA

Obtaining water from	Hydrogeological belts							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
Public tubewells	38.2	54.5	51.8	78.5	58.7	55.8	26.8	23.4
Private tubewells	61.8	45.5	48.2	21.5	41.3	44.2	73.2	76.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	1606	609	518	609	87	5	56	54

(1) N is the weighted number of households in the sample, obtaining drinking water from the hand pump system excluding ringwells.

Table 3.1d

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS OBTAINING WATER FROM PRIVATE HAND PUMP SYSTEMS BY OWNERSHIP, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

The system owned by:	Rural areas	Urban slums and fringes
Respondents	31.5	32.6
Respondents in partnership with others	14.9	4.5
Some one else in the bari	15.2	9.2
Neighbours	36.2	29.8
Others	2.2	23.9
Total	100.0	100.0
N(1)	1689	83

(1) N is the weighted number of households in the sample, obtaining drinking water from the private hand pump system.

3.2. Service coverage per HPS(1)

The survey was not designed to obtain direct estimates of the number of households/people served by a hand pump system. However, combining the data from the survey's three samples (cluster sample, tubewell sample and household sample), it is possible to compute indirect estimates of the parameter for both the public and the private tubewells.

Data from the household sample show that, in the rural area 46.7 percent of the total households used water from the public tubewells and 45.1 percent from the private tubewells, while in the urban slums and fringes did 23.1 percent from the public tubewell and 69.3 percent from the private tubewell (see table 3.2a(i)). Based on these rates and according to the total number of enumerated households and enumerated tubewells in the cluster sample, it is seen that, in the rural clusters 9464 households collected water from 880 public tubewells and 9145 households from 2070 private tubewells, while in the urban slums and fringes were 147 households dependent on 17 public tubewells and 439 households on 122 private tubewells (see table 3.2a(ii)). Thus, on average, in the rural area were 10.8 households found served by a public tubewell and 4.4 households served by a private tubewell and in the urban slums and fringes 9.4 households by a public tubewell and 3.9 households by a private tubewell (see table 3.2a(iii)). With 5.6 members per household in the rural area and 3.5 members per household in the urban slums and fringes (table 3.2a(ii)), this means that a public tubewell covered 60 persons in the rural area and 50 persons in the urban slums and fringes. The corresponding number for a private tubewell was 25 persons for rural areas and 21 persons for the urban slums and fringes.

Following the similar procedures, the service coverages of the public and private tubewells for specific strata of the sample were derived (see tables 3.2b(i) to 3.2b(iii)). Among the rural strata the service coverage by a public tubewell varied from a low of about 5 households/29 persons in the hilly region to a high of 20.2 households/123 persons in the coastal belt. For the private tubewell the variation ranged from 3.5 households/18 persons in the shallow and low water table area to 18 households/104 persons in the hilly regions (see table 3.2b(iii)). Service coverage of a public tubewell was in general higher than of a private tubewell, except in the hilly region. But, the data for the hilly region should be treated with caution, since they were based on very small numbers of observations in the sample.

Table 3.2a(i)

PERCENTAGE OF TOTAL HOUSEHOLDS USING WATER FROM PUBLIC AND PRIVATE TUBEWELLS, IN THE RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Tubewells	Rural areas	Urban slums and fringes
Public	46.7	23.2
Private	45.1	69.3
N(1)	3734	120

Source: Table 3.1a.

(1) N is the total weighted number of households in the sample from a specific area.

Table 3.2a(ii)

STATISTICS FOR ESTIMATION OF SERVICE COVERAGE FOR PUBLIC AND PRIVATE TUBEWELLS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Statistics	Rural areas	Urban slums and fringes
Total number of enumerated households	20274	634
Estimated number of enumerated households using water from:		
Public tubewells	9464	159
Private tubewells	9145	475
Total number of enumerated		
Public tubewells	880	17
Private tubewells	2070	122
Mean number of members per enumerated household	5.6	5.3

Source: Table 3.1a.

Table 3.2a(iii)

ESTIMATED SERVICE COVERAGES FOR PUBLIC AND PRIVATE TUBEWELLS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Service coverage	Rural areas	Urban slums and fringes
For public tubewells		
Number of households	10.8	9.4
Number of persons	60	50
For private tubewells		
Number of households	4.4	3.9
Number of persons	25	21

Table 3.2b(i)

PERCENTAGE OF TOTAL HOUSEHOLDS USING WATER FROM PUBLIC AND PRIVATE TUBEWELLS ACCORDING TO SPECIFIC STRATA

Tubewells	Strata						
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums and fringes
Public	37.1	50.3	48.1	66.8	38.2	27.8	23.2
Private	60.0	42.0	44.7	18.3	26.8	22.2	69.3
N(1)	1655	660	558	716	134	10	120

Source: Table 3.1b.

(1) N is the total weighted number of households in the sample from a specific stratum.

Table 3.2b(ii)

STATISTICS FOR ESTIMATION OF SERVICE COVERAGE FOR PUBLIC AND PRIVATE TUBEWELLS BY DIFFERENT STRATA

Statistics	Strata						
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums and fringes
Total number of enumerated households	8939	3555	3017	3870	731	162	634
Estimated number of enumerated households using water from:							
Public tubewells	3316	1788	1451	2585	279	45	159
Private tubewells	5363	1493	1349	708	196	36	475
Total number of enumerated							
Public tubewells	397	159	155	128	32	9	17
Private tubewells	1222	288	389	149	20	2	122
Mean number of members per enumerated household	5.6	5.3	5.2	6.1	5.3	5.8	5.3

Source: Table

Table 3.2b(iii)

ESTIMATED SERVICE COVERAGE FOR PUBLIC AND PRIVATE TUBEWELLS BY DIFFERENT STRATA

Service coverage	Strata						
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums and fringes
For public tubewells							
Number of households	8.4	11.2	9.4	20.2	8.7	5.0	9.4
Number of persons	47	59	49	123	46	29	50
For private tubewells							
Number of households	4.4	5.2	3.5	4.8	9.8	18.0	3.9
Number of persons	25	28	18	29	52	104	21

3.3. Accessibility

Accessibility to the hand pump system in the survey was defined in terms of location of the system, the distance a user was required to walk to reach to the system and the time he/she needed to fetch water from the system. Defined accessibility has a great significance to promoting adequate use of safe water in the population. The greater the accessibility a household has to the hand pump system, the more it is likely to obtain all of its water from the hand pump system.

3.3.1. Location

A majority of households using public hand pump systems used the public hand pump system located at a place outside a bari (own bari or neighbour's bari) --- about 55 percent in the rural area and about 44 percent in the urban slums and fringes (see table 3.3a). But, some households -- 16.2 percent in the rural area and 12.6 percent in the urban slums and fringes were found to have had the public hand pump system inside their own bari. In consequence, in the rural area 12.2 percent of the public system users had to depend on the public system located inside the neighbour's bari, while in the urban slums and fringes did 10.6 percent; (the percentage having the public hand pump system inside own bari and the percentage having it located inside neighbour's bari are not additive, and therefore, the sum of the two should not be construed as a measure for public hand pump systems installed inside bari). Public hand pump systems located at public places such as mosque compound, school yard, road side etc. were relatively much less used by households in the rural area (17.0 percent) than in the urban slums and fringes (32.6 percent).

Private hand pump systems were mostly located inside the bari of their owners. Nevertheless, a large number of households were found to have had access to private hand pump systems located in their neighbour's bari, constituting 24.4 percent of all private hand pump system users in the rural area and 19.0 percent in the urban slums and fringes.

An important finding from the survey was that a substantial proportion of respondents were not aware about how the site for their public hand pump systems was decided (see table 3.3b). Only 24 percent of respondents in the rural area and only 19 percent in the urban slums and fringes mentioned that sites of their public hand pump systems were selected in consultation with the prospective users. Caretakers played the most important role in the selection of the sites, followed by UP chairmen/members and others local leaders. The site for private hand pump systems, in most cases, was decided by their owners.

Table 3.3a

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY LOCATION OF THE HAND PUMP SYSTEM, ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Location of the system	Rural areas	Urban slums and fringes
	Public	
Inside own bari(1)	16.2	12.6
Inside neighbour's bari(1)	12.2	10.6
Outside own or neighbour's bari	54.6	44.2
Other places	17.0	32.6
Total	100.0	100.0
N(2)	1745	28
	Private	
Inside own bari(1)	56.8	69.3
Inside neighbour's bari(1)	24.4	19.0
Outside own or neighbour's bari	18.0	11.4
Other places	0.8	0.3
Total	100.0	100.0
N(3)	1689	83

(1) The percentages of these two categories are not additive.

(2) N here is the weighted number of households in the sample, obtaining drinking water from the public hand pump system.

(3) N here is the weighted number of households in the sample, obtaining drinking water from the private hand pump system.

Table 3.3b

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS OBTAINING WATER FROM HAND PUMP SYSTEMS BY WHO DECIDED THE SITE OF THEIR HAND PUMP SYSTEMS, SEPARATELY FOR THE PUBLIC AND PRIVATE SYSTEMS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Decided by:	Rural areas	Urban slums and fringes
Public		
DPHE people	7.1	5.0
UP chairmen/members	9.1	11.4
Joint consultation with prospective users	24.3	18.9
Local leaders to their convenience	9.5	14.0
Caretakers	17.5	11.4
Others	0.9	-
Don't know	31.6	39.3
Total	100.0	100.0
N(1)	1745	28
Private		
UP chairmen/members	0.5	-
Joint consultation with prospective users	9.1	0.9
Local leaders to their convenience	0.4	0.3
Owners	67.6	76.9
Others	0.4	-
Don't know	22.0	21.9
Total	100.0	100.0
N(2)	1689	83

(1) N here is the weighted number of households in the sample, obtaining drinking water from the public hand pump system.

(2) N here is the weighted number of households in the sample, obtaining drinking water from the private hand pump system.

3.3.2. Distance/time

The survey design had no provisions to physically measure the distance of a user's household from the hand pump system or to physically verify the time the user needed in fetching water from the system. Both the distance and the time were assessed by asking respondents the following two questions.

(i) What is the distance you are required to walk to reach to the hand pump system? In the dry season? In the wet season?

(ii) How much time is needed to fetch water from the system? During dry season? During wet season?

Thus, the estimates of distance and time, reported in the survey, were the perceived rather than actual measures.

With wide spread availability of hand pump systems, the vast majority of users, in rural areas and the urban slums and fringes users, now have a hand pump system within a perceived distance of 150 metres (see table 3.4a). In the dry season in the rural area, 85 percent of the households reported to be obtaining water from a hand pump system located at a perceived distance of 150 metres with 67 percent giving the distance as 50 metres or less, while for the urban slums and fringes the percentages were 98 percent for the distance of 150 metres or less and 87 percent for 50 metres or less. Distance of the hand pump system increased in the wet season for some households, revealing of increased difficult accessibility during that season. For households in rural areas, the average of reported 'perceived distance' from the hand pump system in the wet season was higher by 3.1 metres compared to 82.2 metres for the dry season while for those in the urban slums and fringes it was higher by 1.4 metres compared to 26.8 metres for the dry season. However, only few of the hand pump system users reported that they stopped using water from the hand pump system in the wet season (see table 3.5).

Proximity to the hand pump system varied among the different strata of the sample, showing greater inconvenience of people in the coastal belt, hilly regions and stony areas (see table 3.4b). In the coastal belt, 26 percent of user households reported to be collecting water from a hand pump system away by over 200 metres; for the hilly regions the corresponding proportion was a high 20 percent. (Note the smallness of the sample for the hilly regions.). Accessibility was relatively better in the stony areas, compared to the coastal belt and hilly regions.

Table 3.4a

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY DISTANCE FROM THE HAND PUMP SYSTEM ACCORDING TO SEASONS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Distance (in metres)	Rural areas	Urban slums and fringes
Dry season		
< 50	66.6	86.5
51-100	13.1	9.0
101-150	5.3	2.7
151-200	5.0	0.9
201 +	10.0	0.9
Total	100.0	100.0
N(1)	3434	111
Mean distance (in metres)(3)	82.2	26.8
Wet season		
< 50	65.4	84.7
51-100	13.2	9.9
101-150	5.8	3.6
151-200	4.7	0.9
201 +	10.9	0.9
Total	100.0	100.0
N(2)	3422	111
Mean distance (in metres)(3)	85.3	28.2

(1) N here is the weighted number of households in the sample, obtaining drinking water from the hand pump system (excluding ringwells) in the dry season.

(2) N here is the weighted number of households in the sample, obtaining drinking water from the hand pump system (excluding ringwells) in the wet season.

(3) Mean is computed from the complete distribution of distance.

Table 3.4b

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY DISTANCE FROM THE HAND PUMP SYSTEM ACCORDING TO SEASONS, BY STRATA

Distance (in metres)	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
Dry season								
< 50	74.0	66.5	71.8	46.2	56.4	60.0	86.7	87.3
51-100	10.7	14.3	14.4	15.6	18.5	20.0	9.2	9.2
101-150	5.0	4.5	5.4	6.2	9.0	-	2.4	2.0
151-200	4.5	6.2	2.7	6.2	5.5	-	0.6	0.5
201 +	5.8	8.5	5.7	25.8	10.6	20.0	1.1	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	1606	609	518	609	87	5	56	54
Mean distance (in metres)(3)	59.1	77.0	58.5	168.4	83.6	70.4	27.1	26.7
Wet season								
< 50	72.8	65.7	70.6	44.1	53.8	60.0	86.7	85.8
51-100	10.9	14.7	14.8	16.1	17.8	-	8.6	10.1
101-150	5.4	4.6	6.4	6.2	9.7	20.0	3.1	2.0
151-200	4.2	6.2	2.5	5.9	6.1	-	0.5	0.5
201 +	6.7	8.8	5.7	27.7	12.6	20.0	1.1	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(2)	1603	609	517	601	86	5	56	54
Mean distance (in metres)(3)	63.8	79.8	57.8	171.9	93.2	72.7	27.8	28.8

(1) N here is the weighted number of households in a stratum, obtaining drinking water from the hand pump system (excluding ringwells) in the dry season.

(2) N here is the weighted number of households in a stratum, obtaining drinking water from the hand pump system (excluding ringwells) in the wet season.

(3) Mean is computed from the complete distribution of distance.

Reported perceived distance varied among users between the private and public hand pump systems (see table 3.4c). A household's proximity to hand pump systems greatly enhanced when it had a hand pump system of its own or had access to a private system owned by other household. For example, while only 57.4 percent among households using public hand pump systems had access to a hand pump system located at a perceived distance of 50 metres or less, the percentage was a higher 76.8 percent for those using private hand pump systems. Similar evidence was notable between the proportions of households within perceived 50 metres from the private and public systems in the urban slums and fringes. Lesser accessibility to the hand pump system among the public system users compared to the private system users was apparent in each of the eight strata of the sample (see table 3.4d). It remained also obvious that the difference was worse for public system users in the coastal belt and stony areas than in the other strata.

Table 3.4c

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY DISTANCE FROM THE HAND PUMP SYSTEM ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION AND THE SEASONS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Distance (in metres)	Rural areas	Urban slums and fringes
	Public	
Dry season		
< 50	57.4	71.9
51 - 100	16.0	25.6
101- 150	6.9	2.5
151- 200	5.1	-
201 +	14.6	-
Total	100.0	100.0
N(1)	1745	28
Mean distance (in metres)(3)	107.51	39.91
Wet season		
< 50	55.7	71.9
51 - 100	16.7	25.6
101- 150	7.2	2.5
151- 200	4.7	-
201 +	15.7	-
Total	100.0	100.0
N(1)	1745	28
Mean distance (in metres)(3)	113.23	40.41

contd...

Table 3.4c (contd.)

Distance (in metres)	Rural areas	Urban slums and fringes
	Private	
Dry season		
< 50	76.8	92.1
51 - 100	9.8	3.6
101- 150	3.6	2.1
151- 200	4.6	0.8
201 +	5.2	1.4
Total	100.0	100.0
N(2)	1689	83
Mean distance (in metres)(3)	56.14	22.49
Wet season		
< 50	75.9	91.0
51 - 100	9.7	3.9
101- 150	4.0	2.6
151- 200	4.6	0.8
201 +	5.8	1.7
Total	100.0	100.0
N(2)	1689	83
Mean distance (in metres)(3)	56.90	28.19

(1) N is the weighted number of households in the sample, obtaining drinking water from the public hand pump system (excluding ringwells) in a season.

(2) N is the weighted number of households in the sample, obtaining drinking water from the private hand pump system (excluding ringwells) in a season..

(3) Mean is computed from the complete distribution of distance.

Table 3.4d

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY DISTANCE FROM THE HAND PUMP SYSTEM ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION AND THE SEASONS, BY STRATA

Distance (in metres)	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
				Public				
Dry season								
< 50	67.0	61.3	64.2	39.4	49.7	66.7	75.7	67.4
51 -100	13.7	17.7	17.2	16.4	24.8	33.3	19.8	32.6
101-150	6.6	6.1	6.6	7.6	8.6	-	4.5	-
151-200	3.8	5.5	4.3	7.0	5.2	-	-	-
201+	8.9	9.4	7.7	29.6	11.7	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	613	332	269	478	51	3	15	13
Mean distance (in metres)(3)	75.7	88.5	75.1	181.9	88.1	53.9	38.5	41.5
Wet season								
< 50	64.0	60.9	63.3	37.7	47.5	66.7	75.7	67.4
51 -100	15.6	18.1	17.1	16.1	24.2	33.3	19.8	32.6
101-150	6.9	6.1	8.1	7.7	10.3	-	4.6	-
151-200	3.5	5.1	3.8	6.6	4.6	-	-	-
201+	10.0	9.8	7.7	31.9	13.5	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	613	332	269	478	51	3	15	13
Mean distance (in metres)(3)	84.2	91.0	72.4	191.0	98.5	53.9	38.7	42.4

contd...

Table 3.4d (contd.)

Distance (in metres)	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
				Private				
Dry season								
< 50	78.3	72.7	79.9	71.1	65.9	50.0	90.7	93.4
51 -100	8.9	10.2	11.3	12.7	9.6	-	5.3	2.0
101-150	3.9	2.6	4.1	0.8	9.7	-	1.7	2.6
151-200	5.0	7.0	1.1	3.4	5.8	-	0.8	0.7
201+	3.9	7.5	3.6	12.0	9.0	50.0	1.5	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(2)	993	278	250	131	36	2	41	42
Mean distance (in metres)(3)	48.9	63.3	40.7	118.9	77.1	91.3	22.9	22.1
Wet season								
< 50	78.2	71.3	78.4	67.6	62.7	50.0	90.7	91.4
51 -100	8.0	10.7	12.3	16.1	8.8	-	4.5	3.2
101-150	4.5	2.7	4.6	0.8	8.8	-	2.5	2.6
151-200	4.7	7.4	1.1	3.4	8.2	-	0.8	0.7
201+	4.6	7.9	3.6	12.1	11.5	50.0	1.5	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(2)	993	278	250	131	36	2	41	42
Mean distance (in metres)(3)	51.2	66.5	42.1	101.0	85.6	96.6	23.7	24.6

(1) N is the weighted number of households in the sample obtaining drinking water from the public hand pump system (excluding ringwells) in a season.

(2) N is the weighted number of households in the sample obtaining drinking water from the private hand pump system (excluding ringwells) in a season.

(3) Mean is computed from the complete distribution of distance.

With proximity to the hand pump system having improved significantly, 66.9 percent of the households reported that they were able to obtain water from it in 10 minutes or less in the dry season, with more than 40 percent spending 5 minutes or less in the rural area (see table 3.6a). For the urban slums and fringes the corresponding percentages appeared even higher, namely, 86.6 percent for 10 minutes or less and 66.8 percent for 5 minutes or less. On average, a household required 15 minutes in the rural area and 7 minutes in the urban slums and fringes to obtain water from the hand pump system in the dry season.

However, time required in the rural area rose significantly in the wet season, upholding the increased inconveniences the rural households faced in obtaining water from the hand pump system during that season. While in the dry season the average time required by a rural household to fetch water from the hand pump system was about 15 minutes, it jumped to 23 minutes for the wet season. There were, however, almost no variations between the dry and wet seasons in the urban slums and fringes.

Table 3.5

PERCENTAGE OF HOUSEHOLDS OBTAINING WATER FROM THE HAND PUMP SYSTEM IN THE DRY SEASON BY SOURCES OF WATER IN THE WET SEASON, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Sources of water	Rural areas	Urban slums and fringes
Hand pump systems	98.4	99.1
Other sources	1.6	0.9
Total	100.0	100.0
N(1)	3434	111

(1) N is the weighted number of households in the sample, obtaining drinking water from the hand pump system in the dry season (excluding ringwells).

As expected, users spent much less time when they obtained water from the private hand pump system than when they obtained water from the public hand pump system (see table 3.6b). In the dry season, while only 57 percent of the public hand pump system users were able to obtain water from the hand pump system spending a perceived time of 10 minutes or less in the rural area, the percentage was higher 72.8 percent for the private hand pump system users there. Most striking differences between the private and public hand pump system users were apparent in the average perceived times they said they spent in the wet season,

Table 3.6a

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TIME NEEDED TO FETCH WATER FROM THE HAND PUMP SYSTEM ACCORDING TO SEASONS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Time is needed	Rural areas	Urban slums and fringes
Dry season		
1 - 5 minutes	42.8	66.8
6 -10 minutes	22.1	19.8
11-15 minutes	10.2	6.0
16-20 minutes	8.4	3.1
21-25 minutes	1.7	0.8
26-30 minutes	9.0	2.9
31 +	5.8	0.6
Total	100.0	100.0
N(1)	3434	111
Mean time (in minutes)(2)	14.56	6.5
Wet season		
1 - 5 minutes	35.9	57.8
6 -10 minutes	20.9	24.5
11-15 minutes	10.8	7.5
16-20 minutes	7.9	3.8
21-25 minutes	3.1	1.7
26-30 minutes	7.5	3.4
31 +	13.3	1.3
Collect from rain water	0.6	-
Total	100.0	100.0
N(1)	3434	111
Mean time (in minutes)(2)	23.13	7.7

(1) N is the weighted number of households in the sample, obtaining drinking water from the hand pump system in a season.

(2) Mean is computed from the complete distribution of time.

varying from 18 minutes for private hand pump system users to 28 minutes for public hand pump system users. Disadvantages of public system users compared to private system users were obvious in each of the rural strata (see table 3.6c). However, variations in perceived times required to obtain water from the private and public hand pump systems in urban slums and fringes were not as remarkable as in rural areas (see table 3.6b).

Table 3.6b

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TIME NEEDED TO FETCH WATER FROM THE HAND PUMP SYSTEM ACCORDING TO THE PUBLIC AND PRIVATE CLASSIFICATION AND THE SEASONS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Time needed	Rural areas	Urban slums and fringes
	Public	
Dry season		
1 - 5 minutes	33.2	44.4
6 -10 minutes	24.1	32.1
11-15 minutes	12.6	11.6
16-20 minutes	10.8	5.4
21-25 minutes	1.8	-
26-30 minutes	10.4	5.5
31 +	7.1	1.0
Total	100.0	100.0
N(1)	1745	28
Mean time (in minutes)(3)	15.80	9.36
Wet season		
1 - 5 minutes	24.6	39.6
6 -10 minutes	23.1	32.1
11-15 minutes	12.9	12.6
16-20 minutes	9.4	6.1
21-25 minutes	3.8	2.2
26-30 minutes	9.3	5.2
31 +	16.5	2.2
Total	100.0	100.0
N(1)	1745	28
Mean time (in minutes)(3)	28.04	10.50

contd...

Table 6b (contd.)

Time needed	Rural areas	Urban slums and fringes
	Private	
Dry season		
1 - 5 minutes	52.8	74.4
6 -10 minutes	20.0	15.6
11-15 minutes	7.6	4.2
16-20 minutes	6.0	2.3
21-25 minutes	1.5	1.1
26-30 minutes	7.5	2.0
31 +	4.6	0.4
Total	100.0	100.0
N(2)	1689	83
Mean time (in minutes)(3)	13.28	5.57
Wet season		
1 - 5 minutes	47.7	63.9
6 -10 minutes	18.6	21.8
11-15 minutes	8.5	5.9
16-20 minutes	6.3	3.0
21-25 minutes	2.4	1.5
26-30 minutes	5.6	2.8
31 +	10.0	1.1
Total	100.0	100.0
N(2)	1689	83
Mean time (in minutes)(3)	18.02	6.80

(1) N here is the weighted number of households obtaining drinking water from the public hand pump system (excluding ringwells) in a season.

(2) N here is the weighted number of households obtaining drinking water from the private hand pump system (excluding ringwells) in a season.

(3) Mean is computed from the complete distribution of time.

It was also obvious in the time data that people faced greater difficulty in collecting water from the hand pump system in the coastal belt and the stony areas (see table 3.6c). For example, while the mean time spent by households in obtaining water from the hand pump system in the dry season was reported at fewer than 15 minute in all other rural strata, it was 22 minutes for the coastal belt and 19 minutes from the stony areas. Similar variations of the coastal belt and stony area strata with the other rural strata were evident in the time data for the private hand pump systems.

Table 3.6c

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TIME NEEDED TO FETCH WATER FROM THE HAND PUMP SYSTEM ACCORDING TO SEASONS, BY STRATA

Time is needed	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
				Public				
Dry season								
1 - 5 minutes	36.4	34.6	46.5	20.5	35.4	33.3	47.1	41.2
6 -10 "	25.1	31.1	21.7	19.6	19.5	33.3	30.0	34.7
11-15 "	12.6	12.9	11.5	13.7	8.2	33.3	12.1	10.9
16-20 "	9.8	7.7	7.1	16.5	8.6	-	6.3	4.4
21-25 "	1.3	3.0	1.0	2.1	2.8	-	-	-
26-30 "	9.1	8.1	9.7	13.6	13.1	-	4.6	6.6
31+ "	5.7	2.7	2.5	14.0	12.3	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
N(1)	613	332	269	478	51	3	15	13
Mean time (in minutes)(3)	14.7	11.9	11.4	22.0	19.3	10.1	8.9	9.9
Wet season								
1 - 5 minutes	26.6	28.3	38.5	11.6	24.1	33.3	40.2	39.0
6 -10 "	25.1	26.7	23.2	18.1	22.4	33.3	31.8	32.5
11-15 "	14.5	14.9	9.6	11.8	9.8	33.3	12.1	13.1
16-20 "	7.9	12.1	8.2	10.4	5.7	-	5.7	6.6
21-25 "	3.7	2.9	3.4	4.8	5.1	-	4.0	-
26-30 "	7.6	8.1	5.6	14.3	9.8	-	3.9	6.6
31+ "	14.5	6.8	11.6	28.1	22.0	-	2.3	2.2
Collect from rain water	0.2	-	-	0.9	1.1	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
N(1)	613	332	269	478	51	3	15	13
Mean time (in minutes)(3)	31.9	15.0	15.2	38.8	35.0	11.4	10.5	10.6

Table 3.6c (contd.)

Time is needed	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
				Private				
Dry season								
1 - 5 minutes	54.5	48.2	59.5	39.6	41.4	50.0	71.7	77.0
6 -10 "	20.3	19.4	19.1	21.4	18.7	50.0	15.7	15.5
11-15 "	7.2	8.9	5.7	11.1	11.2	-	5.4	2.9
16-20 "	5.9	6.1	5.2	7.6	6.5	-	3.3	1.3
21-25 "	1.3	2.7	-	2.5	2.4	-	1.5	0.7
26-30 "	6.1	11.6	8.3	7.6	8.7	-	1.5	2.6
31+ "	4.6	3.1	2.1	10.2	11.2	-	0.8	-
Total	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
N(2)	993	278	250	131	36	2	41	42
Mean time (in minutes)(3)	13.7	11.8	9.3	19.7	15.4	9.3	6.0	5.2
Wet season								
1 - 5 minutes	51.0	40.2	54.8	29.6	28.3	50.0	63.0	64.7
6 -10 "	18.7	16.7	17.0	24.7	22.8	50.0	20.1	23.7
11-15 "	8.3	11.5	6.8	6.8	9.6	-	7.1	4.7
16-20 "	5.9	6.6	6.2	8.5	7.9	-	4.6	1.5
21-25 "	2.0	4.4	1.1	3.4	3.2	-	1.5	1.5
26-30 "	5.1	4.9	5.7	10.1	5.6	-	2.9	2.6
31+ "	8.2	14.8	8.4	13.5	21.6	-	0.8	1.3
Collect from rain water	0.7	0.9	-	3.4	0.8	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
N(2)	993	278	250	131	36	2	41	42
Mean time (in minutes)(3)	18.3	17.2	11.9	28.4	22.8	13.4	7.0	6.6

(1) N here is the weighted number of households obtaining drinking water from the public hand pump system (excluding ringwells) in a season.

(2) N here is the weighted number of households obtaining drinking water from the private hand pump system (excluding ringwells) in a season.

(3) Mean is computed from the complete distribution of time.

3.3.3. Differentials

Differentials in accessibility to the hand pump system by socio-economic characteristics were examined by looking at variations in the proportion of households having the hand pump system located inside own bari as well as at variations in the average distance of households from the system. Variations in perceived time required to obtain water from the hand pump system were not included, considering that they would have almost similar patterns as would those of the perceived distance have. Socio-economic characteristics were measured in terms of: educational levels of head of household, ownership of agricultural land by household, household's possessions and roof type of the main dwelling structure of household. More than one measure were taken, considering that as no single indicator was enough to explain the socio-economic variations among households in the survey population.

Land ownership was measured in terms of whether a household had agricultural land owned and worked by its members. A household is assumed to be relatively richer if it possesses agricultural land. Household possessions were ascertained by asking a respondent how many of the following items she had in her household: almirah, table/chair/bench, cot, wrist watch/clock, radio, two-in one, television, sewing machine, motor cycle, bicycle. These possessions are assumed to be another good index of the socio-economic status of a household. Whether or not a household having concrete/tin on the roof of the main dwelling structure is also employed as a measure of its economic well-being. Households with tin/concrete roof are considered to be relatively well-off compared to households not having concrete/tin roof. The education level of the household's head is an indicator of both social and economic status of the household. Thus, its inclusion is needless to emphasize in explaining the socio-economic relationships.

A household accessibility to the hand pump system increased with its socio-economic status (see table 3.7a). The more a household was socio-economically well-off, the more it was likely to have had a hand pump system inside the bari. While only 31.1 percent of users had the hand pump system inside the bari among rural households with the family head having never attended school or having had an education less than the primary level, the proportion was higher 41.8 percent for those with the family head having completed primary education or above but less than the completed secondary level and was further higher 55.3 percent for those with the family head having completed secondary education or more. Variations by land ownership showed that 42.4 percent had the hand pump system inside the bari among rural households owning agricultural land compared to only 29.9 percent for those having no agricultural land. Similarly, higher proportions were found having the hand pump system inside bari among rural households having more household's possessions and among rural households having concrete/tin roof for the main dwelling structure than not having concrete/tin roof. Similar

patterns of variations in the proportion having the hand pump system inside bari by socio-economic characteristics of households was evident in the urban slums and fringes.

Observed socio-economic differentials in the proportion of households having the hand pump system inside bari were apparent even among users for public systems (see table 3.7b). This was an indication that the rich/influential in the community got some of the public tubewells allocated mostly for their personal use.

Table 3.7a

PERCENTAGE OF HOUSEHOLDS HAVING THE HAND PUMP SYSTEM INSIDE BARI ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
Education level of household head		
Less than primary level (included never attended school)	31.1(2184)	50.0(68)
Completed primary level and lower secondary	41.8(748)	59.2(27)
Secondary and above	55.3(318)	66.7(12)
Land ownership		
Does not own land	29.9(1705)	52.7(95)
Own land	42.4(1730)	70.1(15)
Number of items		
0	26.8(995)	44.4(18)
1-3	31.7(1652)	50.8(61)
4-6	55.4(719)	64.0(25)
7 +	77.1(70)	85.7(7)
Roof type		
Thatches	27.9(1563)	38.0(25)
Concrete/tin	44.7(1786)	64.7(73)

(1) Figures with parentheses give the weighted number of households obtaining drinking water from the hand pump system in a specific category.

Table 3.7b

PERCENTAGE OF HOUSEHOLDS HAVING THE HAND PUMP INSIDE BARI SEPARATELY FOR THE PUBLIC AND PRIVATE HAND PUMP SYSTEMS, ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
	Public	
Education level of household head		
Less than primary level (included never attended school)	13.4(1154)	13.8(19)
Completed primary level and lower secondary	21.9(379)	0.0(6)
Secondary and above	25.4(123)	0.0(2)
Land ownership		
Does not own land	12.5(909)	13.8(25)
Own land	20.3(837)	0.0(2)
Number of items		
0	15.5(566)	14.0(6)
1-3	13.7(878)	9.6(17)
4-6	25.7(291)	20.3(6)
7 +	7.1(10)	-
Roof type		
Thatches	14.0(855)	8.9(9)
Concrete/tin	19.8(820)	22.4(12)

contd...

Table 3.7b (contd.)

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
	Private	
Education level of household head		
Less than primary level (included never attended school)	50.9(1029)	65.2(48)
Completed primary level and lower secondary	62.3(369)	85.0(20)
Secondary and above	74.1(195)	73.8(7)
Land ownership		
Does not own land	49.8(796)	66.8(70)
Own land	63.1(893)	83.0(13)
Number of items		
0	41.9(428)	58.3(13)
1-3	52.1(774)	65.5(44)
4-6	75.7(427)	77.1(19)
7 +	89.1(60)	92.3(7)
Roof type		
Thatches	44.7(707)	54.6(16)
Concrete/tin	65.9(966)	73.1(61)

(1) Figures with parentheses give the weighted number of households obtaining drinking water from the hand pump system in a specific category.

Also, perceived distance from the hand pump system varied by socio-economic characteristics, upholding that households belonging to the higher socio-economic status had greater accessibility to the hand pump system (see tables 8a(i) and 8a(ii)). Rural households had an average perceived distance of 90 metres from the hand pump system in the dry season if their family heads had never attended school or had an education less than the primary level. The average dropped to 75 metres for rural households with the family head having completed primary education or above but less than the completed secondary education, and then to 52 metres for those with the head having completed secondary education or above. Similarly, the average perceived distance in the dry season varied for rural households

Table 3.8a(i)

MEAN DISTANCE (IN METRES) OF HOUSEHOLDS FROM THE HAND PUMP SYSTEM IN THE DRY SEASON ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
Education level of household head		
Less than primary level (included never attended school)	88.8(2184)	28.1(68)
Completed primary level and lower secondary	74.7(748)	28.1(27)
Secondary and above	51.5(318)	18.8(12)
Land ownership		
Does not own land	89.8(1705)	27.8(45)
Own land	74.7(1730)	20.9(15)
Number of items		
0	111.2(995)	31.7(18)
1-3	80.7(1652)	28.8(61)
4-6	50.0(719)	22.2(25)
7 +	36.0(70)	10.9(7)
Roof type		
Thatches	101.0(1563)	26.7(25)
Concrete/tin	65.0(1786)	19.6(73)
Mean distance	82.2(3434)	26.9(111)

(1) Figures with parentheses give the weighted number of households obtaining drinking water from the hand pump system in a specific category.

by land ownership showing greater accessibility for those owning agricultural land than those not owning agricultural land, varied by households' possessions showing greater accessibility for those having more possessions than for those having fewer possessions, and varied by the roof type showing greater accessibility for households having concrete/tin on the roof of the main dwelling structure than those having no concrete/tin on the roof of the main dwelling structure. Greater proximity to the hand pump system among households in the higher socio-economic status were also apparent in the variations with respect to perceived distance in the dry season for the urban slums and fringes.

Socio-economic variations in the perceived average distance from the hand pump system had similar patterns in the wet season as in the dry season, discerning increased distance of the hand pump system across all socio-economic status groups (see table 8a(ii)). The differences were, however, negligible for the households in the highest socio-economic groups. Those households reported almost uniform access to the system through out the year.

Table 3.8a(ii)

MEAN DISTANCE (IN METRES) OF HOUSEHOLDS FROM THE HAND PUMP SYSTEM IN THE WET SEASON ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
Education level of household head		
Less than primary level (included never attended school)	92.6(2177)	29.3(68)
Completed primary level and lower secondary	78.6(742)	30.8(27)
Secondary and above	49.9(318)	18.6(12)
Land ownership		
Does not own land	94.3(1699)	29.5(95)
Own land	76.9(1724)	20.7(15)
Number of items		
0	116.8(990)	36.2(18)
1-3	83.7(1644)	29.7(61)
4-6	36.1(718)	23.0(25)
7 +	35.5(70)	11.0(7)
Roof type		
Thatches	105.6(1557)	27.3(25)
Concrete/tin	67.3(1781)	21.5(73)
Mean distance	85.5(3422)	28.3(111)

(1) Figures with parentheses give the weighted number of households obtaining drinking water from the hand pump system in a specific category.

Patterns of socio-economic variations in perceived distance were about same between the users of the public and private hand pump systems (see tables 3.8b(i) and 3.8b(ii)). Like the private system, the public system was found located in closer proximity to the users if they were from the higher socio-economic status. Thus, it became obvious that the more rich/influential users were more likely to have the public hand pump system located at their convenient place.

Table 3.8b(i)

MEAN DISTANCE (IN METRES) OF HOUSEHOLDS FROM THE HAND PUMP SYSTEM IN THE DRY SEASON, SEPARATELY FOR THE PUBLIC AND PRIVATE HAND PUMP SYSTEMS, ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
	Public	
Education level of household head		
Less than primary level (included never attended school)	111.0(1154)	40.3(19)
Completed primary level and lower secondary	104.9(379)	31.6(6)
Secondary and above	71.6(123)	67.3(2)
Land ownership		
Own land	103.4(837)	33.4(2)
Does not own land	111.1(909)	40.5(25)
Number of items		
0	132.6(566)	48.0(6)
1-3	101.5(878)	38.1(17)
4-6	73.8(291)	37.0(6)
7 +	185.7(10)	-
Roof type		
Concrete/tin	93.3(820)	32.3(12)
Thatches	120.6(855)	39.1(9)
All	107.44(1745)	39.9(28)

contd...

Table 3.8b(i) (contd.)

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
	Private	
Education level of household head		
Less than primary level (included never attended school)	63.9(1029)	23.5(48)
Completed primary level and lower secondary	43.8(369)	28.5(20)
Secondary and above	38.9(195)	10.9(10)
Land ownership		
Does not own land	65.5(796)	23.2(70)
Own land	47.8(893)	18.6(13)
Number of items		
0	82.9(428)	24.3(13)
1-3	57.1(774)	25.4(44)
4-6	33.9(427)	18.5(19)
7 +	12.2(60)	11.1(7)
Roof type		
Thatches	77.4(707)	19.7(16)
Concrete/tin	41.0(966)	17.0(61)
All	56.1(1689)	22.5(83)

(1) Figures with parentheses give the weighted number of households obtaining drinking water from the hand pump system in a specific category.

Table 3.8b(ii)

MEAN DISTANCE (IN METRES) OF HOUSEHOLDS FROM THE HAND PUMP SYSTEM IN THE WET SEASON, SEPARATELY FOR THE PUBLIC AND PRIVATE HAND PUMP SYSTEMS, ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
	Public	
Education level of household head		
Less than primary level (included never attended school)	118.1(1152)	40.9(19)
Completed primary level and lower secondary	107.7(375)	31.7(6)
Secondary and above	73.3(123)	67.3(2)
Land ownership		
Does not own land	117.9(904)	41.0(25)
Own land	108.3(835)	33.6(2)
Number of items		
0	141.5(564)	48.2(6)
1-3	106.5(874)	38.6(17)
4-6	76.4(291)	37.8(6)
7 +	191.2(10)	-
Roof type		
Thatches	129.8(852)	39.5(9)
Concrete/tin	96.0(817)	33.2(12)
	113.3(1738)	40.4(28)

contd...

Table 3.8b(ii) (contd.)

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
	Private	
Education level of household head		
Less than primary level (included never attended school)	63.8(1026)	25.0(48)
Completed primary level and lower secondary	49.0(367)	32.1(20)
Secondary and above	35.3(195)	10.6(10)
Land ownership		
Does not own land	67.4(795)	25.3(70)
Own land	47.5(889)	18.4(13)
Number of items		
0	84.0(426)	30.7(13)
1-3	57.8(771)	26.5(44)
4-6	34.6(427)	19.2(19)
7 +	10.7(60)	11.3(7)
Roof type		
Thatches	76.3(705)	20.3(16)
Concrete/tin	43.1(964)	19.1(61)
	56.9(1684)	24.2(83)

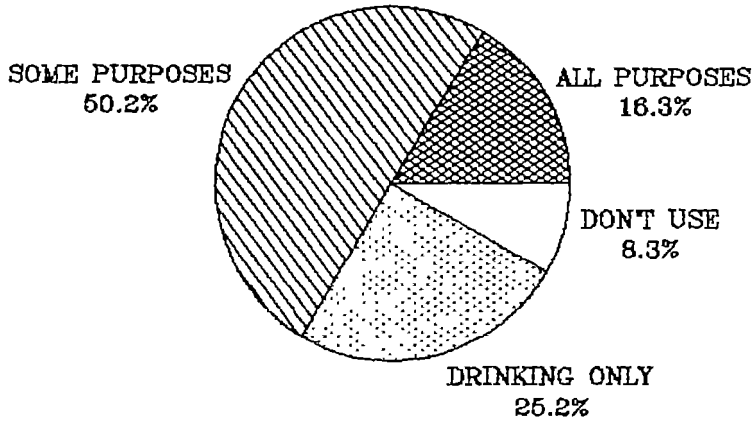
(1) Figures with parentheses give the weighted number of households obtaining drinking water from the hand pump system in a specific category.

3.4. Use of water

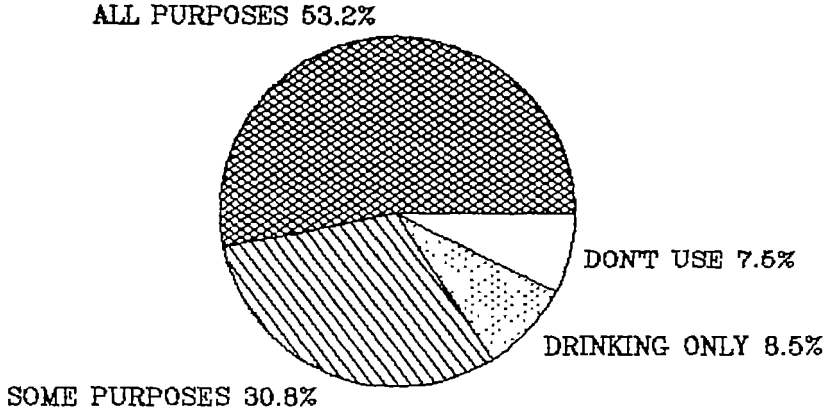
Although households almost universally have access to the hand pump system, use of the full requirement of water from the system still remains low (see figure 3.3). In the rural area, only 16.3 percent of households were found obtaining all the water they consumed from the hand pump system, while 25 percent of households used water from it for drinking only. Uses of the hand pump system for all the water needs were higher among the households in urban slums and fringes. But they too did not have more than 55 percent drawing the full requirement of water from the hand pump system.

Figure 3.3

USES OF WATER HAND PUMP SYSTEMS (PUBLIC & PRIVATE COMBINED)IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES



RURAL AREAS



URBAN SLUMS AND FRINGES

SOURCE:NATIONAL WATER/SANITATION SURVEY 1991

Households using private hand pump systems were, however, more likely to draw their full requirement of water from the hand pump system than were those using public hand pump systems (see table 3.9a). The differences were evident in both the rural and the urban slum/fringe areas. While in the rural area only 12 percent obtained the full requirement of water from the hand pump system among households using public hand pump systems, the proportion was almost double (23.6 percent) for those using private hand pump systems there. For the urban slums and fringes, proportions drawing full requirement of water varied from 39.3 percent for households using public hand pump systems to a higher 64 percent for those using private hand pump systems.

Table 3.9a

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING THE HAND PUMP SYSTEM BY USES OF WATER FROM THE SYSTEM, SEPARATELY FOR THE PRIVATE AND THE PUBLIC SYSTEM, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Uses	Rural areas	Urban slums and fringes
Public		
For drinking and all domestic purposes	12.0	39.3
For drinking and some domestic purposes	53.4	50.0
Only for drinking	34.6	10.7
Total	100.0	100.0
N(1)	1744	28
Private		
For drinking and all domestic purposes	23.6	64.0
For drinking and some domestic purposes	56.2	27.5
Only for drinking	20.2	8.5
Total	100.0	100.0
N(2)	1689	83

(1) N here is the weighted number of respondents in the sample, obtaining households drinking water from the public hand pump system (excluding ringwells).

(2) N here is the weighted number of respondents in the sample, obtaining households drinking water from the private hand pump system (excluding ringwells).

Uses of water from the hand pump system by eight strata of the sample are given in table 3.9b. Greater proportions obtaining full requirement of water from the hand pump system among the private than public system users were apparent everywhere except in the coastal belt, stony areas and hilly regions. In the coastal belt, uses of water from the hand pump system for drinking and all domestic purposes were extremely low; there, only about 4 percent among both the private and public system users reported that they obtained their full requirement of water from the hand pump system (see table 3.9b). Among the other rural strata, uses of water from the hand pump system for drinking and all domestic purposes varied from 11.0 percent for users of the private system in the stony area to 20.5 percent in

Table 3.9b

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING WATER FROM THE HAND PUMP SYSTEMS, SEPARATELY FOR THE PUBLIC AND THE PRIVATE SYSTEM, ACCORDING TO STRATA

Uses	Strata							
	SWT	LWT	SWT/ LWT	Coastal	Stony	Hilly	Urban slums	Urban fringes
				Public				
For drinking and all domestic purposes	11.8	20.5	16.0	4.3	11.0	33.3	37.7	39.3
For drinking and some domestic purposes	61.6	68.1	59.5	28.3	61.5	66.7	41.7	60.7
Only for drinking	26.6	11.4	24.5	67.4	27.5	-	20.6	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	612	332	269	478	51	3	15	13
				Private				
For drinking and all domestic purposes	23.9	30.5	26.0	4.2	13.0	33.3	63.2	64.8
For drinking and some domestic purposes	56.2	59.3	60.5	40.6	61.3	33.3	24.5	30.6
Only for drinking	19.9	10.2	13.5	55.2	25.7	33.3	12.3	4.6
Total	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
N(2)	993	278	250	131	36	3	41	42

(1) N here is the weighted number of respondents in a specific stratum, obtaining households drinking water from the public hand pump system (excluding ringwells).

(2) N here is the weighted number of respondents in a specific stratum, obtaining households drinking water from the private hand pump system (excluding ringwells).

the low water table area and to 33.3 percent in the hilly region. For users of the public hand pump system, the range of variations was from 13 percent in the stony area to 30.5 percent in the low table area and to 33.3 percent in the hilly region. The rates for the hilly region were, however, less credible, based on too small numbers of observations.

In response to the question about reasons for not using water from the hand pump system for drinking and all domestic purposes, 'It requires hard labour to obtain the full requirement from the hand pump system' was cited as a reason by 44 percent of respondents not using the full requirement of water from hand pump systems in the rural area and 51 percent in the urban slums and fringes (see table 3.10a). 'Other's tubewell' was another important reason reported by 39 percent in the rural area and 47 percent in the urban slum. 'Far away location of the system', and 'It requires much time to obtain water' were also among important reasons given by the respondents. Easier access to the pond also worked as an inhibiting factor.

Table 3.10a

PERCENTAGE OF RESPONDENTS GIVING SPECIFIC REASONS FOR THEIR HOUSEHOLDS NOT USING WATER FROM THE HAND PUMP SYSTEM FOR ALL DOMESTIC PURPOSES, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Reasons	Rural areas(1)	Urban slums and fringes(1)
Location is far away in terms of distance	37.9	27.7
Takes time to collect water from tubewell	31.9	38.3
One is to put on hard labour	44.3	51.1
Other's tubewell	39.0	46.8
Caretakers/owners object frequent collection	16.0	27.7
Tubewell will be non-functional if it is used for all purposes	7.8	6.4
Some times water level goes down	6.4	6.4
Have easy access to pond	37.4	21.3
Location is inconvenient in terms of privacy	16.4	23.4
Busy for household work	8.6	4.3
Others	28.1	38.3
N(2)	2824	47

(1) Percentage do not add up to 100.0 because of multiple responses.
(2) N is the weighted number of respondents in the sample, who were not using water from the hand pump system for all domestic purposes.

'Far away location' was given as a problem more frequently by users of the public system than by users of the private system (see table 3.10b). Thereby, there were, obviously, relatively more respondents complaining that it required hard labour to obtain the full requirement of water from the hand pump system, among the private than public users. There were also relatively more respondents mentioning 'lacking of privacy at the tubewell site' as a reason for the public system than for the private system. As among users of the private hand pump system, 'other's tubewell' was mentioned by a substantial proportion among users of the public system. This seems to be revealing that some of the caretakers manages use of the public hand pump system as if it was his own system.

There were variations in use of the full requirement of water from the hand pump system with the proximity to the system (see table 3.11a). User-households were much more likely to obtain their full requirement of water from the hand pump system if they had the system within 50 metres than if they had it farther away. Among user-households having the hand pump system within 50 metres, about 24 percent obtained their full requirement of water from the system in any season, while for those having the system farther than 50 metres away the rates were fewer than 8 percent. However, variations with proximity was not as pronounced among users beyond 50 metres from the hand pump system. Observed relation of proximity with the proportion of households obtaining full requirement of water from the hand pump system was noticeable among users of both the private and the public hand pump system (see table 3.11b).

Use of water from the hand pump system for drinking and for all domestic purposes was also found associated with the socio-economic status of user-households (see table 3.12a). A user-household was more likely to consume the full requirement of water from the hand pump system if it was from the higher socio-economic status than if it was from the lower socio-economic status (see table 12a). The proportion using the full requirement of water was only 15 percent among rural households having no households possessions. It rose gradually with rural households having more possessions reaching to 26 percent for those having 7 items or more in possession. Similarly, using of the full requirement of water rose with education of the household head in the rural area. The differentials by household possessions and households heads educational levels were also evident among households in the urban slums and fringes. But, there were no significant variations between the households having or not having agricultural land either in the rural area or in the urban slums and fringes. Thus, it seemed that possession of agricultural land was not a major determinant of use of the full requirement of water from the hand pump system.

Table 3.10b

PERCENTAGE OF RESPONDENTS GIVING SPECIFIC REASONS FOR THEIR HOUSEHOLDS NOT USING WATER FROM THE HAND PUMP SYSTEM FOR ALL DOMESTIC PURPOSES, SEPARATELY FOR THE PUBLIC AND PRIVATE SYSTEMS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Reasons	Rural areas(1)	Urban slums and fringes(1)
Public		
Location is far away	46.0	31.5
Takes time to collect water from tubewell	31.3	43.2
One is to put in hard labour	53.3	61.1
Other's tubewell	36.5	40.2
Caretaker objects frequent collection	8.9	16.7
Tubewell will be non-functional if it is used for all purposes	8.6	8.6
Some times water level goes down	8.2	12.3
Have easy access to pond	37.2	23.8
Location is inconvenient in terms of privacy	21.8	37.7
Busy for household work	9.3	3.3
N(2)	1534	17
Private		
Location is far away	28.1	24.6
Takes time to collect water from tubewell	32.6	35.7
One is to put in hard labour	42.2	48.4
Other's tubewell	41.8	50.9
Owner objects frequent collection	24.6	34.7
Tubewell will be non-functional if it is used for all purposes	6.8	4.7
Some times water level goes down	4.2	3.4
Have easy access to pond	37.5	20.4
Location is inconvenient in terms of privacy	10.0	16.3
Busy for household work	7.7	4.6
Others	30.7	37.2
N(3)	1291	30

(1) Percentage do not add up to 100.0 because of multiple responses.
(2) N is the weighted number of public system user-respondents in the sample, who were not using water from the hand pump system for all domestic purposes.
(3) N is the weighted number of private system user-respondents in the sample, who were not using water from the hand pump system for all domestic purposes.

Table 3.11a

USE OF WATER FROM THE HAND PUMP SYSTEM FOR ALL DOMESTIC PURPOSES BY DISTANCE OF HOUSEHOLD FROM THE SYSTEM, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Distance (in metres)	Rural areas(1)	Urban slums and fringes(1)
Dry season		
< 50	23.5(2300)	64.4(96)
51-100	7.2(445)	13.6(10)
101-150	7.2(181)	0.0(2)
151-200	7.9(166)	-
201 +	2.6(342)	
All	17.7(3434)	57.6(111)
Wet season		
< 50	24.0(2253)	64.6(95)
51-100	7.4(455)	13.3(10)
101-150	6.7(194)	-
151-200	7.4(160)	-
201 +	2.5(360)	
All	17.7(3434)	57.6(111)

(1) Figures within brackets give the number of households having access to the hand pump system in a specific category.

However, socio-economic differentials were about non-existent among the users of the public hand pump system in the rural area, with respect to use of water from the system for drinking and all domestic purposes (see table 3.12b). Among those users, proportions obtaining full requirement of water from the hand pump system were low across all socio-economic groups of households, considered in the analysis (see table 3.12b). Thus, it seemed, there were more important other factors affecting use of the full requirement of water from the public hand pump system.

Table 3.11b

PERCENTAGE OF HOUSEHOLDS USING WATER FROM THE HAND PUMP SYSTEM FOR ALL DOMESTIC PURPOSES BY DISTANCE OF HOUSEHOLD, SEPARATELY FOR THE PUBLIC AND PRIVATE SYSTEMS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Distance (in metres)	Rural areas(1)	Urban slums and fringes(1)
	Public	
Dry season		
< 50	16.7(1003)	49.4(20)
51-100	6.9(280)	11.3(7)
101-150	6.6(120)	-
151-200	8.4(89)	-
201 +	2.9(254)	-
All	12.0(1745)	38.5(28)
Wet season		
< 50	17.2(971)	49.4(20)
51-100	7.1(291)	11.3(7)
101-150	6.3(126)	0.0(1)
151-200	7.6(82)	-
201 +	2.7(274)	-
All	12.0(1745)	38.5(28)
	Private	
Dry season		
< 50	28.8(1297)	68.3(76)
51-100	7.8(165)	25.0(4)
101-150	8.3(165)	0.0(2)
151-200	7.2(78)	-
201 +	1.7(78)	-
All	23.6(1689)	64.0(83)
Wet season		
< 50	29.2(1283)	68.6(75)
51-100	7.9(164)	17.7(3)
101-150	7.5(68)	0.0(2)
151-200	7.2(77)	0.0(1)
201 +	0.1(97)	0.0(1)
All	23.6(1689)	64.0(83)

(1) Figures within brackets give the number of households having access to the hand pump system in a specific category.

Table 3.12a

USE OF WATER FROM THE HAND PUMP SYSTEM FOR ALL DOMESTIC PURPOSES ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
Education level of household head		
Less than primary level (included never attended school)	16.7(2184)	52.9(68)
Completed primary level and lower secondary	18.3(748)	63.0(27)
Secondary and above	26.1(318)	75.0(12)
Land ownership		
Does not own land	16.0(1705)	57.9(95)
Own land	19.4(1730)	60.0(15)
Number of items		
0	14.9(995)	55.6(18)
1-3	16.8(1652)	55.7(61)
4-6	22.9(719)	58.4(25)
7 +	25.6(70)	71.4(7)

(1) Figures within brackets give the number of households obtaining drinking water from the hand pump system in a specific category.

3.5. Awareness of benefits

Most known reasons for using water from the hand pump system were 'it prevents stomach disorder' and 'it prevents diarrhoea/ cholera' (see table 3.13). A small number of respondents were aware that water from the hand pump system might prevent other diseases as well. For example, only 29 percent of respondents in the urban slum knew that water from the hand pump system prevented skin diseases, while it was was only 17.7 percent for those of the rural area. This explains why only a small proportion of households having access to the hand pump system used the hand pump system for all of their water needs.

Table 3.12b

PERCENTAGE OF HOUSEHOLDS USING WATER FROM THE HAND PUMP SYSTEM FOR ALL DOMESTIC PURPOSES, SEPARATELY FOR THE PUBLIC AND PRIVATE SYSTEMS, ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas(1)	Urban slums and fringes(1)
Public		
Education level of household head		
Less than primary level (included never attended school)	12.3(1154)	35.5(19)
Completed primary level and lower secondary	11.6(379)	50.0(6)
Secondary and above	10.7(123)	50.0(2)
Land ownership		
Does not own land	12.7(909)	38.7(25)
Own land	11.3(837)	50.0(2)
Number of items		
0	12.8(566)	27.7(6)
1-3	11.4(878)	41.6(17)
4-6	12.6(291)	40.1(6)
7 +	10.0(10)	-
Private		
Education level of household head		
Less than primary level (included never attended school)	21.5(1029)	59.8(48)
Completed primary level and lower secondary	25.2(369)	65.0(20)
Secondary and above	35.9(195)	80.0(10)
Land ownership		
Does not own land	19.7(796)	64.7(70)
Own land	27.0(893)	60.1(13)
Number of items		
0	17.4(428)	65.8(13)
1-3	22.9(774)	59.5(44)
4-6	30.0(427)	65.2(19)
7 +	31.5(60)	86.1(7)

(1) Figures within brackets give the number of households obtaining households drinking water from the hand pump system in a specific category.

Table 3.13

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SPECIFIC REASONS GIVEN FOR DRINKING OF WATER FROM THE HAND PUMP SYSTEM, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Reasons	Rural areas(1)	Urban slums and fringes(1)
Prevents stomach disorder	55.4	72.1
Prevents diarrhoea/cholera	76.4	76.6
Prevents dysentery	12.5	18.0
Prevents skin diseases	17.7	28.8
Prevents other diseases	17.7	14.4
Pure water	60.0	74.8
Don't have any pond	2.9	3.6
Others	10.9	9.0
N(2)	3434	111

(1) Percentage do not add up to 100.0 because of multiple responses.

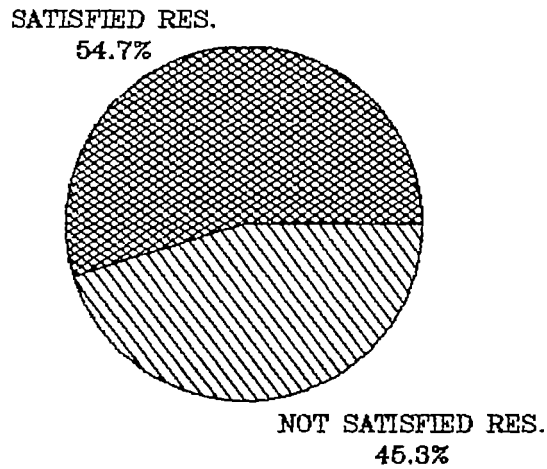
(2) N is the weighted number of respondents in the sample, obtaining households drinking water from the tubewell.

3.6. Dissatisfaction

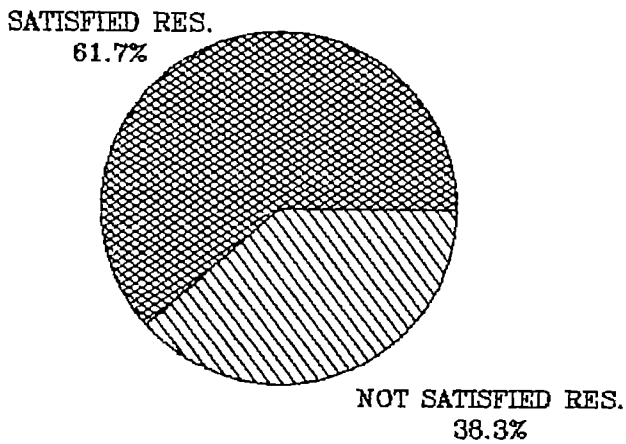
A large percentage of respondents among user-households reported that they were not satisfied using water from hand pump systems (see figure 3.4). The proportion dissatisfied was more pronounced among users of the public hand pump systems than of private hand pump systems (see table 3.14). There were, however, no remarkable variations in the level of dissatisfaction between the rural and urban slum/fringe areas for users of the either system. In the rural area, 53 percent of users of public hand pump systems reported their dissatisfaction compared to only 37 percent for the private hand pump systems. For the urban slum the ratio was 50 percent from public hand pump systems compared to only 33 percent from private hand pump systems. Most frequently reported cause of dissatisfaction was the hand pump system was located at a distant place (see table 3.15). Next important cause was the hand pump system was located at a place lacking privacy; this reason was given much more frequently by users in the urban slum than in the rural area. An additional cause of dissatisfaction for the private system users were that the owners objected to frequent collection of water. Also, a substantial number, 15 percent in rural areas and 19.8 percent in urban slums/fringes among users of the public system complained that caretakers objected to the frequent collection of water from the hand pump system.

Figure 3.4

SATISFIED USER VS NOT SATISFIED USERS OF HAND PUMP SYSTEMS IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES



RURAL AREAS



URBAN SLUMS AND FRINGES

Source:Water & Sanitation Survey -1992

Table 3.14

PERCENTAGE OF RESPONDENTS SATISFIED USING WATER FROM THE HAND PUMP SYSTEM, SEPARATELY FOR THE PRIVATE AND PUBLIC SYSTEMS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Satisfaction	Rural areas	Urban slums and fringes
	Public	
Satisfied respondents	47.0	50.0
Not satisfied respondents	53.0	50.0
Total	100.0	100.0
N(1)	1745	28
	Private	
Satisfied respondents	62.6	66.3
Not satisfied respondents	37.4	33.7
Total	100.0	100.0
N(2)	1689	83

(1) N here is the weighted number of respondents in the sample, obtaining households drinking water from the public hand pump system.

(2) N here is the weighted number of respondents in the sample, obtaining households drinking water from the private hand pump system.

Table 3.15

PERCENTAGE OF DISSATISFIED RESPONDENTS USING WATER FROM THE HAND PUMP SYSTEM BY SPECIFIC REASONS OF THEIR DISSATISFACTION, SEPARATELY FOR THE PUBLIC AND PRIVATE SYSTEMS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Satisfaction	Rural areas(1)	Urban slums and fringes(1)
Public		
Water discharge not enough	15.0	19.4
Location is inconvenient in-terms of distance	79.0	69.3
Location is inconvenient in terms of privacy	42.9	76.1
Tubewell caretaker does not allow frequent collection	15.5	19.8
N(2)	924	14
Private		
Water discharge not enough	9.8	19.0
Location is inconvenient in-terms of distance	65.6	45.9
Location is inconvenient in terms of privacy	33.0	35.8
Tubewell owner does not allow frequent collection	44.8	38.1
N(3)	632	28

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N here is the weighted number of respondents in the sample, who were not satisfied using water from the public tubewell.

(3) N here is the weighted number of respondents in the sample, who were not satisfied using water from the private tubewell.

Chapter 4

SANITATION SITUATION

This chapter presents the survey finding from the household sample, as regards to: prevalence of latrines, accessibility to latrines, proximity of latrines to water sources, awareness about different types of latrines, perception of hygienic latrines, costs of latrines, reasons for not having latrines, use levels of latrines, and awareness about benefits of using latrines.

4.1. Prevalence of latrines

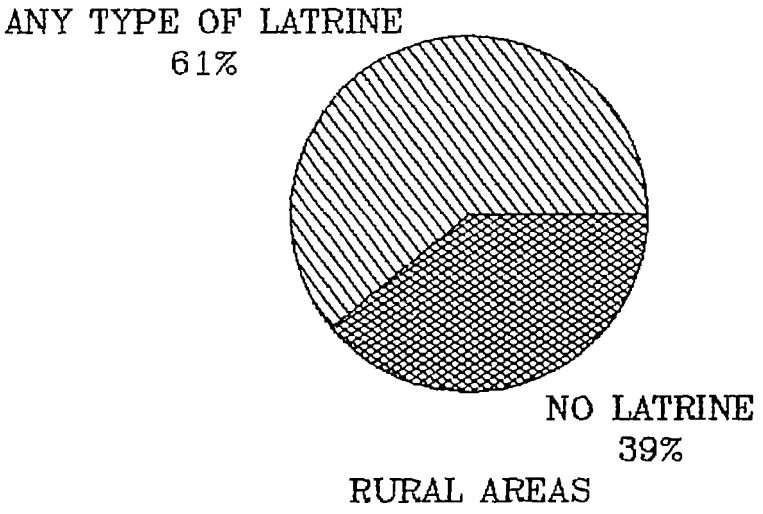
Possession of latrine by households in the survey was determined by the interviewer, asking the respondent the following question "Does your household possess any latrine?". If reported, the interviewer physically observed the latrine to be sure of its existence and ascertain its type. Interviewers employed in the survey were specifically trained about different types of latrines, so that they had no difficulty in correctly identifying any type of latrine prevalent in the survey population.

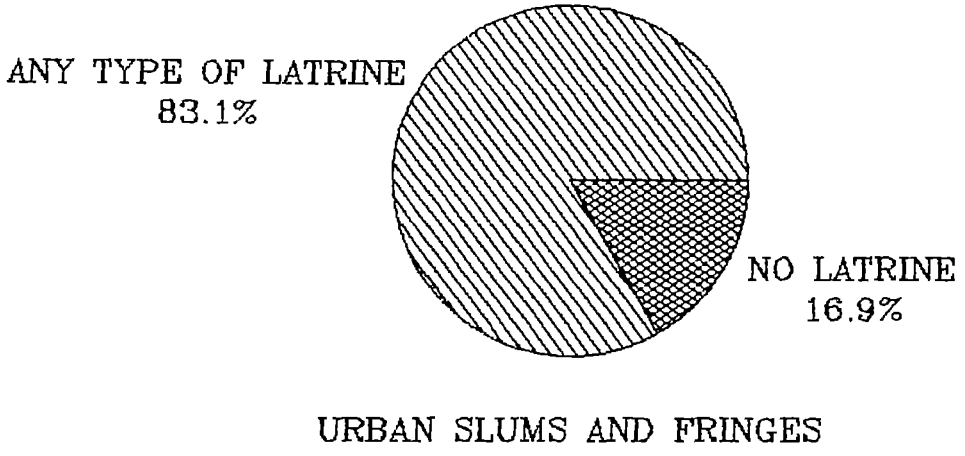
Possession of latrines by households has risen significantly in rural areas as well as in the urban slums and fringes (see figure 4.1). In the rural area 61 percent of households now have latrines with 25.6 percent possessing a hygienic latrine. In the urban slums and fringes, proportions of households having latrines were even higher, 83 percent with 48 percent possessing a hygienic latrine. Between the urban slums and fringes there were, however, no remarkable variations; 84.0 percent of households reported to have had latrines in the urban slums, for the urban fringes the figure was only slightly lower 82.4 percent.

Septic tank latrines, Water sealed latrines and Pit latrines were classified as the hygienic latrine (see table 4.1). Other latrines such as Hanging latrines, Open latrines were considered as un-hygienic latrines. In the rural area, the most used hygienic latrines were pit latrines followed by water sealed latrines and Septic tank latrines in that order. The most used hygienic latrines in the urban slums and fringes were, on the other hand, the Water sealed latrines followed by Septic tank latrines and Pit latrines. But between the urban slum and fringe, water sealed latrine was relatively more used in the urban slum and the Pit latrine in the urban fringe.

Figure 4.1

POSSESSION OF LATRINES IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES





SOURCE:NATIONAL WATER/SANITATION SURVEY-1991

Table 4.1

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY POSSESSION OF LATRINES ACCORDING TO TYPE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of latrine	Rural areas	Urban	
		Slums	Fringes
Hygienic latrine	25.6	49.2	47.9
Water sealed latrine	7.2	25.4	17.2
Septic tank latrine	3.2	14.3	15.6
Pit latrine	15.3	9.5	15.1
Un-hygienic latrine	33.3	34.9	34.5
Open latrine	28.3	20.6	18.8
Hanging latrine	6.8	14.3	15.7
Other	0.2	-	-
Any type of latrine	61.0	84.1	82.4
No Latrine	39.0	15.9	17.6
Total	100.0	100.0	100.0
N(1)	3734	63	56

(1) N is the weighted number of households in the sample.

Possession of latrines varied by socio-economic status of households. A household was much more likely to have a latrine if it was from higher socio-economic status than if it was from lower socio-economic status. While only 54 percent of rural households with the family head having never attended school or having an education less than the primary level had the latrine, the percentage rose to 74 percent for those with the family head having completed primary education or more but less than the secondary level and then to over 83 percent for those having completed secondary education or above. Similarly, the proportion of households having households latrine varied by household possessions and by ownership of agricultural land. Close association of latrines possession was also reported in the data for the urban slum.

Apart from the economic status of the household, independent influences of education of the family head remained evident in the survey. In any group of the economic classifications, a household was found more likely to have had a latrine with increased level of education of its family head (see tables 4.1a(i) and 4.1a(ii)). While among households not having any agricultural land in the rural area only 49 percent reported to have had a latrine where the family head had no education or had an education less than the primary level, the percentage rose to about 69 percent with the family head having an education worth primary level or above. Likewise, proportions having household latrine varied by education of the family head among rural households having agricultural land. Variations in possession of latrine by education, when controlled for land ownership, were also apparent in the urban slums and fringes. Similar evidence showing influences of education among subgroups of households classified by possession of items was registered in the data.

Table 4.1a(i)

POSSESSION OF LATRINES ACCORDING TO EDUCATION LEVEL OF HOUSEHOLD HEAD, CONTROLLED BY LAND OWNERSHIP, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Education level(1)	Land ownership(2)	
	Own land	Does not own land
Rural areas		
Less than primary level (including never attended school)	61.0(982)	48.6(1417)
Primary level and above	79.5(820)	68.9(321)
All	69.5(1802)	52.3(1738)
Urban slums and fringes		
Less than primary level (including never attended school)	100.0(5)	77.3(66)
Primary level and above	91.7(12)	93.3(30)
All	97.0(17)	82.2(96)

(1) Two educational categories were used because of small number of observations for educational levels above the primary.

(2) Figures with parentheses give the weighted number of households in a specific category.

Table 4.1a(ii)

POSSESSION OF LATRINES BY EDUCATION LEVEL OF HOUSEHOLD HEAD, CONTROLLED BY NUMBER OF HOUSEHOLD ITEMS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Education level(1)	Number of items(2)			
	0	1-3	4-6	7 +
Rural areas				
Less than primary level(including never attended school)	44.6(940)	55.5(1194)	76.3(249)	93.8(16)
Primary level and above	61.1(95)	70.8(527)	83.9(466)	92.9(56)
All	46.0(1035)	60.3(1721)	81.5(715)	91.0(73)
Urban slums and fringes				
Less than primary level(including never attended school)	68.8(16)	77.8(45)	80.0(10)	100.0(1)
Primary level and above	66.7(3)	93.8(16)	88.9(18)	100.0(7)
All	68.4(19)	83.5(61)	85.7(28)	100.0(8)

(1) Two educational categories were used because of small number of observations for educational levels above the primary.

(2) Figures with parentheses give the weighted number of households in a specific category.

Increases in the number of households' latrines were a recent development as it appeared from the reported age of latrines, shown in table 4.2. In the rural area, household latrines were on average 3.6 years old, with 36 percent of them being constructed in less than one year earlier than the interview date and another 24.7 percent being constructed one year to less than two years earlier. Households' latrines in the urban slum had slightly higher average age than those of the rural area.

Table 4.1b

POSSESSION OF LATRINES ACCORDING TO SELECTED CHARACTERISTICS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Selected characteristics	Rural areas	Urban slums and fringes
Land ownership		
Own land	69.3	95.6
Does not own land	52.4	80.9
Number of items		
0	45.6	68.4
1-3	60.2	81.8
4-6	82.2	96.2
7 +	90.5	100.0
Education level of household head		
Less than primary level (included never attended school)	53.6	78.9
Completed primary level and lower secondary	74.0	96.6
Secondary and above	83.0	92.3

4.2. Use of latrines

Among households having latrines, 91 percent of the respondents always used the latrine (see table 4.3a). About 8 percent of them sometime used it, while some (though fewer than one percent) never or rarely did it. In contrast, about 7 percent of respondents in households not having latrines reported that they always used latrines. Practice of using latrine was much higher in the urban slums and fringes than in rural areas. In the urban slums and fringes 98 percent among households having latrines always used latrine, compared to 91 percent among those in rural areas. For households not having latrine the difference was even more striking ranging from only 6 percent always using latrine in rural areas to 36 percent in the urban slums and fringes.

Table 4.2

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY AGE OF THEIR LATRINE IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Age of latrine	Rural areas	Urban slums and fringes
Less than one year	36.4	24.6
One year to less than 2 years	24.7	17.3
2-5 years	22.8	29.3
5 years or above	15.8	18.0
Don't know	0.3	10.8
Total	100.0	100.0
N(1)	2275	99
Mean age(2)	3.6 years	4.2 years

(1) N is the weighted number of sampled households having latrine, excluding NS (Not Stated) cases, if any. The rural sample had one NS case.

(2) Mean is computed from the complete distribution of latrines by single years of age, excluding 'don't know' cases.

Table 4.3a

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY LEVELS OF USING LATRINE AMONG THE HOUSEHOLDS HAVING LATRINE AND HOUSEHOLDS NOT HAVING LATRINE

Level of use	Households		All
	Having latrine	Not having latrine	
Always	91.2	6.5	58.7
Sometime	8.4	10.8	9.3
Rarely	0.2	7.2	2.9
Never	0.2	75.5	29.1
Total	100.0	100.0	100.0
N(1)	2375	1477	3852

(1) N is the weighted number of respondents in a specific category of households.

Table 4.3b

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY LEVELS OF USING LATRINE AMONG THE HOUSEHOLDS HAVING LATRINE AND HOUSEHOLDS NOT HAVING LATRINE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Level of use	Households		All
	Having latrine	Not having latrine	
	Rural areas		
Always	90.9	6.1	57.7
Sometime	8.7	10.6	9.5
Rarely	0.2	7.2	3.0
Never	0.2	76.1	29.8
Total	100.0	100.0	100.0
N(1)	2276	1457	3734
	Urban slums and fringes		
Always	98.1	35.5	87.5
Sometime	1.9	27.3	6.2
Rarely	-	8.0	1.4
Never	-	29.2	4.9
Total	100.0	100.0	100.0
N(1)	99	20	120

(1) N is the weighted number of respondents in a specific category of households.

Respondents were questioned about the use of latrine by specific categories of their households' members, such as children, boys, girls, adult males and adult females. Though not useful as proportions of people using latrines, they provide some ideas as to general levels of latrine use in the survey population (see table 4.4a).

Use of latrine by children (aged one year or more but less than six years) still remains extremely low; fewer than 17 percent of respondents reported that children from their households used the latrine in the urban slums and fringes while even fewer did in the rural area.

Among boys the use of latrine was limited to only 41 percent of households in the rural area. Girls were much more likely to use the latrine. Girls were reported to be using latrine in 57 percent of households in the rural area and 87 percent in the urban slums and fringes.

As can be seen from table 4.4a, questions were asked about the usage of latrine during both the day time and the night time. Based on data from this table, it was evident that adult males were much less likely to use latrines than were adult females. While females used latrines in 64.5 percent of households in the rural area in day time and 55.4 percent at night time, the proportion was 55 percent for males for day time and 49 percent for night time. Similar variations were apparent in the urban slums and fringes. On the overall, people were much more likely to use latrine in the urban slums and fringes, compared to the rural areas (see table 4.4b).

Respondents' awareness about benefits of using latrines are shown in table 4.5. Most frequently reported benefits were 'Bad smell cannot spread out' and 'Nobody can see from outside'. Other given reasons such as 'Environment is not polluted', 'Bacteria cannot spread out', 'One does not become sick' indicate some understanding of the health benefits. But these were mentioned by no more than 30 percent in the rural area and by no more than 38 percent in the urban slum.

4.3. Accessibility

Accessibility to the latrine was measured in terms of its location and the distance from the main dwelling house. A half of the households had the latrine located inside the inner compound of the bari, in both the rural and urban slum areas (see table 4.6). But, about one third of the rural households with about a quarter of the urban slum households had it outside the outer compound. When a household latrine is placed outside the outer compound, accessibility to it is greatly hampered, particularly for women and girls.

Proximity of the latrine from the dwelling house was reported as 10 metres or less for slightly fewer than 50 percent of the rural households and over 60 percent for the urban slum households (see table 4.6). Nevertheless, the average perceived distance from the dwelling house remained as 19 metres in the rural area and 13 metres in the urban slum, with some of the households having their latrines located at a perceived distance of 20 metres from the dwelling house.

Table 4.4a

PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC PLACES AS THE USUAL PLACE OF DEFECATION FOR DIFFERENT CATEGORIES OF HOUSEHOLD MEMBERS, DURING NIGHT AND THE DAY TIME

Categories of members/usual place of defecation	Day time	Night
Children (age, 1 year to 5 years		
Latrine	8.8	5.0
On the Path/Street/Jungle	27.6	14.8
Lawn	25.5	39.0
Veranda/inside the room	3.8	9.5
Fixed place around the homestead	19.6	19.4
No fixed place	14.2	11.6
Others	0.5	0.7
Boys (age, 6-15 years)		
Latrine	42.3	34.2
On the Path/Street/Jungle	47.0	40.2
Lawn	1.0	6.5
Veranda/inside the room	0.2	0.3
Fixed place around the homestead	3.5	9.5
No fixed place	5.7	9.3
Others	0.2	0.1
Girls (age, 6-15 years)		
latrine	56.6	45.7
On the Path/Street/Jungle	35.2	33.4
Lawn	0.4	4.0
Veranda/inside the room	0.1	0.5
Fixed place around the homestead	2.2	8.2
No fixed place	5.5	8.1
Others	0.0	0.2
Adult males (age, above 15 years)		
Latrine	55.4	49.0
On the Path/Street/Jungle	40.8	42.8
Fixed place around the homestead	0.5	2.6
No fixed place	2.9	4.6
Others	0.3	1.0
Adult females (age, above 15 years)		
Latrine	64.5	55.4
On the Path/Street/Jungle	31.8	34.9
Fixed place around the homestead	0.6	3.9
No fixed place	2.8	4.9
Others	0.2	0.9

Table 4.4b

PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC PLACES AS THE USUAL PLACE OF DEFECATION FOR DIFFERENT CATEGORIES OF HOUSEHOLD MEMBERS, DURING NIGHT AND THE DAY TIME, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Categories of members/usual place of defecation	Day time	Night
	Rural areas	
Children		
Latrine	8.6	4.7
On the Path/Street/Jungle	27.9	15.1
Lawn	25.4	39.0
Veranda/inside the room	3.8	9.4
Fixed place around the homestead	19.8	19.5
No fixed place	14.1	11.6
Others	0.4	0.7
Boys		
Latrine	41.4	33.2
On the Path/Street/Jungle	47.8	41.0
Lawn	1.0	6.5
Veranda/inside the room	0.2	0.2
Fixed place around the homestead	3.6	9.6
No fixed place	5.9	9.4
Others	0.1	0.1
Girls		
latrine	55.6	44.7
On the Path/Street/Jungle	36.0	34.1
Lawn	0.4	4.0
Veranda/inside the room	0.1	0.4
Fixed place around the homestead	2.3	8.4
No fixed place	5.6	8.3
Others	-	0.1
Adult males		
Latrine	54.3	47.9
On the Path/Street/Jungle	41.8	43.8
Fixed place around the homestead	0.5	2.6
No fixed place	3.0	4.7
Others	0.4	1.0
Adult females		
Latrine	63.6	54.4
On the Path/Street/Jungle	32.7	35.7
Fixed place around the homestead	0.6	4.0
No fixed place	2.8	5.0
Others	0.3	0.9

contd...

Table 4.4b (contd.)

Categories of members/usual place of defecation	Day time	Night
Urban slums and fringes		
Children		
Latrine	16.0	12.0
On the Path/Street/Jungle	16.0	6.7
Lawn	30.7	38.7
Veranda/inside the room	4.0	13.3
Fixed place around the homestead	16.0	17.3
No fixed place	14.6	9.3
Others	2.7	2.7
Boys		
Latrine	72.8	65.7
On the Path/Street/Jungle	18.2	14.8
Lawn	1.5	6.0
Veranda/inside the room	1.5	1.5
Fixed place around the homestead	-	4.5
No fixed place	3.0	6.0
Others	3.0	1.5
Girls		
latrine	87.5	75.8
On the Path/Street/Jungle	9.3	10.7
Lawn	-	4.5
Veranda/inside the room	-	1.5
Fixed place around the homestead	-	3.0
No fixed place	1.6	3.0
Others	1.6	1.5
Adult males		
Latrine	87.9	86.0
On the Path/Street/Jungle	10.3	11.3
Fixed place around the homestead	-	0.9
No fixed place	0.9	0.9
Others	0.9	0.9
Adult females		
Latrine	91.7	88.1
On the Path/Street/Jungle	6.7	9.3
Fixed place around the homestead	-	0.9
No fixed place	0.8	0.9
Others	0.8	0.9

Table 4.5

PERCENTAGE OF RESPONDENTS AWARE OF SPECIFIC BENEFITS OF USING LATRINES, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Benefits	Rural areas	Urban slums and fringes
Bad smell cannot spread out	82.3	94.2
Environment is not polluted	29.9	37.5
No body can see from out side	79.0	72.5
Bacteria cannot spread out	29.2	42.5
Does not become sick	30.0	29.2
Others	11.8	5.8
N(2)	3734	120

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample.

4.3.1. Proximity to water sources

Among households having access to a hand pump system and possessing a latrine, 69 percent hand the latrine away from the hand pump system by over 20 metres in the rural area; only 18 percent had the two facilities distanced by fewer than 10 metres (see table 4.7). Proximity between the the latrine and hand pump system was much more close in the urban slum, being at an average of only 25 metres there compared to 90 metres in the rural area.

Latrines were located much closer to the pond than to the hand pump system, in the rural area. The perceived distance of the latrine averaged at 54 metres for ponds compared to 90 metres for hand pump systems. For the urban slum the reversal was true, with the average distance of the latrine being 44 metres for the pond and 25 metres for the hand pump system. Other water sources of a household, if it had them, were further away from the latrine compared to both the pump system and the pond.

Table 4.6

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY LOCATION OF LATRINE AND ITS DISTANCES FROM DWELLING HOUSE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Location/distances	Rural areas	Urban slums and fringes
Location		
Inside the inner compound	50.7	49.5
Inside the outer compound	13.8	23.2
Out side the compound	32.4	26.3
In between outer and inner compounds	2.7	1.0
Neighbour's compound	0.2	-
Others	0.2	-
Total	100.0	100.0
N(1)	2276	99
Distance (in metres) from dwelling house		
< 10	47.0	61.9
11-15	13.8	13.5
16-20	13.4	10.0
21 and above	25.8	14.6
Total	100.0	100.0
N(1)	2275	99
Mean distance (in metres)	18.97	13.08

(1) N here is the weighted number of households having latrines.

Table 4.7

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY DISTANCES OF LATRINE FROM WATER SOURCES, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Location/distances	Rural areas	Urban slums and fringes
Distance (in metres) from hand pump		
< 10	18.0	48.7
11-15	6.8	9.1
16-20	6.3	8.6
21 and above	68.9	33.6
Total	100.0	100.0
N(1)	2006	90
Mean distance (in metres)	89.99	25.26
Distance (in metres) from pond		
< 10	30.6	27.6
11-15	8.2	11.3
16-20	7.9	3.6
21 and above	53.3	57.5
Total	100.0	100.0
N(2)	1698	29
Mean distance (in metres)	54.16	43.50
Distance (in metres) from other water sources		
< 10	24.1	23.8
11-15	6.6	3.6
16-20	6.7	7.4
21 and above	62.6	65.2
Total	100.0	100.0
N(3)	454	22
Mean distance (in metres)	103.61	131.10

(1) N here is the weighted number of households, having latrines and using water from the hand pump system at least for drinking.

(2) N here is the weighted number of households having latrines and using water from ponds at least for some domestic purposes.

(3) N here is the weighted number of households having latrines and using water from sources other than the hand pump system and ponds, at least for some domestic purposes.

4.4. Awareness of specific types of latrines

Awareness was high about hygienic latrines among women in both the rural and urban slum areas (see table 4.8). Among households having latrines in the rural area, 67 percent of respondents knew of water sealed latrines, and 60 percent of Septic tank latrines. Similar awareness of those latrines were noted among the respondents in the urban slum. But, awareness about Pit latrines was relatively less, mentioned by only 48 percent in the rural area and a fewer 41 percent in the urban slum. Most of the respondents were found to have the perception that either Septic tank latrines or water sealed latrines were the best type of latrines (see table 4.9). Given in table 4.10 are the reported reasons for considering the septic tank latrine or water sealed latrine or pit latrine, as the best type of latrine. Respondents not having household latrines also had high proportions aware of the septic tank latrine, water sealed latrine and pit latrine, as hygienic latrines (see table 4.11).

Table 4.8

PERCENTAGE OF RESPONDENTS AWARE OF SPECIFIC TYPES OF LATRINE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of latrine	Rural areas	Urban slums and fringes
Water sealed/slab latrine	66.9	66.7
Septic tank latrine	60.3	75.8
Pit latrine	48.3	41.1
Hanging latrine	27.1	30.3
Others	36.4	28.3
Don't know	4.4	7.1
N(2)	2276	99

(1) Percentage do not add up to 100.0 because of multiple responses.

(1) N is the weighted number of respondents in the sample, who were from households having latrine.

Table 4.9

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY PERCEIVED BEST TYPE OF LATRINE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Type of latrine	Rural areas	Urban slums and fringes
Water sealed/slab latrine	40.4	30.9
Septic tank latrine	56.7	68.8
Pit latrine	2.1	-
Open latrine	0.5	0.3
Hanging latrine	0.3	-
Total	100.0	100.0
N(1)	2177	93

(1) N is the weighted number of respondents in the sample, who were aware of more than one type of latrine.

Table 4.10

PERCENTAGE OF RESPONDENTS GIVING SPECIFIC REASONS FOR PERCEIVING A SPECIFIC TYPE OF LATRINE AS THE BEST TYPE OF LATRINE

The latrine is best because	Best type of latrine		
	Water sealed/slab	septic tank	Pit latrine
Stench cannot spread out	82.6	87.1	72.3
Stools not visible	54.5	57.9	70.2
Stools cannot spread out	36.8	33.7	36.2
One does not get sick, using it	25.1	28.2	27.7
No problem in using it in the wet season	14.9	18.5	8.5
While defecating, one is not visible from outside	44.6	47.7	38.3
It can be kept neat and clean	37.0	46.6	12.8
It can exist for a long time	15.3	21.0	8.5
One can comfortably sit down	25.2	32.4	23.4
Others	10.2	10.0	12.8
N(1)	908	1298	47

(1) N is the weighted number of respondents in the sample, who were reported best type of latrine.

(2) Percentage do not add up to 100.0 because of multiple responses.

4.5. Costs of latrines

Costs incurred in the construction of specific types of latrines are shown in table 4.12. Since respondents were not aware of the costs, they reported these with assistance obtained from their husbands. Septic tank latrines were the most expensive latrine costing on average Tk.5173/- in the rural area and Tk.3850/- in the urban slum. Next most expensive were the water sealed latrine involving an average expense of Tk.1215/- in the rural area and Tk.1143/- in the urban slum. Pit latrines were much less expensive compared to water sealed latrines and septic latrines. On the average, construction of a pit latrine did not involve more money than were spent in the construction of an un-hygienic latrine such as Hanging latrine, Open latrine, etc. Thus, most households should have the ability to build a pit latrine.

4.6. Reasons for not having latrines

Among households not having latrines, except 18 percent in the rural area and 35 percent in the urban slums and fringes, every household had the minimum space to build a latrine outside the dwelling structure (see table 4.13). The minimum space is a 5 feet by 5 feet area. But, most respondents among those households mentioned that they were poor and had no money to build a latrine (see table 4.14)

Table 4.11

PERCENTAGE OF RESPONDENTS NOT HAVING HOUSEHOLD LATRINES BY THEIR AWARENESS OF HYGIENIC LATRINES, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Hygienic latrines	Rural areas	Urban slums and fringes
Septic tank latrine	55.9	65.0
Water sealed/slab latrine	57.9	65.0
Pit latrine	32.3	10.0
N(2)	1457	20

(1) Percentages do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents from households not having latrine.

Table 4.12

PERCENTAGE DISTRIBUTIONS OF LATRINES BY COSTS ACCORDING TO TYPE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Costs of latrine (in taka)	Type of latrine					
	Water sealed/ slab latrine	Septic tank latrine	Pit latrine	Open latrine	Hanging latrine	Others
	Rural areas					
0	2.2	0.9	28.9	31.1	11.1	-
1 - 50	-	0.0	11.0	8.9	7.8	25.0
51-100	1.1	0.9	10.0	13.8	12.2	12.5
101-200	6.3	-	18.7	18.2	13.8	12.5
201-300	4.5	-	8.2	5.6	14.2	-
301-400	9.3	-	4.6	2.7	3.6	-
401-500	10.1	1.7	2.1	2.1	6.0	-
501-1000	29.9	12.7	4.5	3.6	5.7	12.5
1001-1500	9.7	5.9	1.1	1.1	4.5	-
1501-2000	4.9	3.4	1.1	0.6	2.7	-
2001 +	14.6	54.2	0.9	1.7	8.3	-
Don't know	7.4	20.3	8.9	10.6	10.1	37.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
N(1)	267	118	572	1057	254	8
Mean costs(2) (in taka)	1215.90	5173.81	218.46	240.41	676.43	318.76
	Urban slums and fringes					
0	-	-	6.7	20.8	-	-
1 - 50	-	-	6.7	4.2	-	-
51-100	-	-	6.7	12.5	11.1	-
101-200	2.1	-	13.3	8.3	22.2	-
201-300	3.8	-	13.3	8.3	22.2	-
301-400	4.3	-	6.7	4.2	5.6	-
401-500	7.1	-	6.7	4.2	5.6	-
501-1000	33.9	5.5	13.3	4.2	5.6	-
1001-1500	19.5	5.5	6.7	-	-	-
1501-2000	2.0	5.5	-	-	-	-
2001 +	5.1	27.8	-	-	-	-
Don't know	22.2	55.7	19.9	33.3	27.7	-
Total	100.0	100.0	100.0	100.0	100.0	-
N(1)	26	18	15	24	18	-
Mean costs(2) (in taka)	1143.07	3850.32	396.99	258.80	358.69	-

(1) N is the weighted number of latrines listed under a specific type in the sample.
(2) Mean costs were computed from the complete distribution.

Table 4.13

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS NOT HAVING LATRINE BY AVAILABILITY OF MINIMUM SPACE REQURIED TO BUILD A LATRINE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Availability of minimum space(1)	Rural areas	Urban slums and fringes
Yes	81.2	64.6
No	18.8	35.4
Total	100.0	100.0
N(2)	1457	20

(1) A household needs 25 square feet space to build a latrine.

(2) N is the weighted number of households not having latrine.

Table 4.14

PERCENTAGE OF RESPONDENTS GIVING SPECIFIC REASONS FOR THEIR HOUSEHOLDS NOT HAVING LATRINE, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Reasons given for not having latrine	Rural areas	Urban slums and fringes
Poor/no money	81.4	85.0
Don't have sufficient space to make latrine	18.0	30.0
Had a latrine before, it is now damaged	9.0	10.0
No body uses latrine in the family	8.7	-
Others	12.8	10.0
N(2)	1457	20

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents from households not having latrine.

Chapter 5

HEALTH AWARENESS AND HYGIENIC PRACTICES

Several questions were asked in the survey to ascertain extent of health awareness among women in the survey population and to ascertain the levels of hygienic practices among themselves and their household members. The chapter also examines the relationship of diarrhoeal disease with water and sanitation.

5.1. Relationship of hygiene with water and sanitation

Table 5.1 shows the awareness of relationship of hygiene with water and sanitation, in the population. While looking at the categories in the table, it should be remembered that none of the categories was read out by the interviewer to a respondent. The interviewer ticked a category only if the respondent spontaneously mentioned it in responses to the question about hygienic practices.

When asked about what a person need to follow to keep himself/herself healthy, only about three to four percent of respondents both in rural areas and in the urban slums and fringes mentioned 'use tubewell water for all purposes'. Even 'drink tubewell water' was not mentioned by more than 16 percent among rural respondents and more than 30 percent among respondents in the urban slums and fringes, although a significantly higher percentage were found to be aware of the benefits of tubewell water, when interviewed in the context of tubewell (see table 3.13). 'Use latrine' was reported by only 6.6 percent among rural respondents and by only 11 percent among respondents in the urban slums and fringes. Spontaneous reporting of 'clean hands with soap or ash after defecation' was also not appreciable.

5.2. Diseases caused by contaminated water

Awareness that drinking of contaminated water causes diarrhoea/stomach disorder were high among respondents (see table 5.2). But, their awareness was astonishingly low for the other diseases caused by it. Only 5.9 percent of rural respondents and only 9.2 percent of respondents in the urban slums and fringes did know, for example, that contaminated water might be a cause of typhoid, while there was about none mentioning jaundice/ hepatitis as a disease associated with 'using/drinking of contaminated water'.

Table 5.1

PERCENTAGE OF RESPONDENTS AWARE OF SPECIFIC PRACTICES THAT A PERSON NEED TO FOLLOW TO KEEP HIMSELF/ HERSELF IN GOOD HEALTH, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Practices	Rural areas(1)	Urban slums and fringes(1)
Brush teeth	31.8	48.4
Clean hands with soap or ash after defecation	12.6	21.1
Take bath	91.1	93.7
Use soap	74.1	84.2
Have vaccination	4.4	6.5
Put on clean clothes	75.6	84.0
Undertake exercise	5.6	9.0
Participate in games	4.6	7.7
Take nutritious food	90.7	92.8
Properly clean and cover food items	44.8	61.5
Drink tubewell water	16.1	29.8
Take regular rest	17.5	21.6
Use latrine	6.6	10.9
Proper disposal of domestic garbage	9.3	6.4
Living in airy and sunny dwellings	2.6	3.4
Use tubewell water for all purposes	3.6	3.5
Avoid going barefoot to defecate	1.4	1.7
Dispose of children's stools in a latrine	1.3	1.6
Others	58.4	59.1
N(2)	3734	120

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample.

5.3. Causes of worm infestation

Almost no respondent knew that indiscriminate defecation was a cause of worm infestation (see table 5.3). Also, most respondents were found not aware that 'improper hand washing practices' and 'walking bare footed' may lead to worm infestation. Traditional beliefs that 'Taking of sugar/molasses causes worm infestation still persisted among over 8 out of every 10 women in both in rural areas and in the urban slums and fringes.

Table 5.2

PERCENTAGE OF RESPONDENTS AWARE OF DISEASES CAUSED WITH DRINKING OR USING OF CONTAMINATED WATER, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Diseases	Rural areas(1)	Urban slums and fringes(1)
Polio	0.2	-
Diarrhoea	89.2	89.2
Malaria	6.3	8.3
Typhoid	5.9	9.2
Dysentery	21.7	26.7
Stomach disorder	62.8	73.3
Eye infection	0.6	0.8
Skin diseases	43.0	58.3
Jaundice/hepatitis	0.9	0.8
Does not cause any diseases	0.5	0.8
Don't know	0.6	1.7
N(2)	3734	120

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample.

Table 5.3

PERCENTAGE OF RESPONDENTS AWARE OF CAUSES OF WORM INFESTATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Causes of worm infection	Rural areas(1)	Urban slums and fringes(1)
Indiscriminate defecation	0.4	-
Walking bare footed	8.0	14.2
Eating of banana	27.5	20.0
Taking of sugar/molasses	83.4	87.5
Improper hand washing practices	2.9	6.7
N(2)	3734	120

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample.

5.4. Hand washing practices

Over 90 percent of respondents mentioned that they washed their hands after defecation, after cleaning up the behind of a child and before serving/taking foods (see tables 5.4 to 5.6). But it was only a small proportion using soap in any case. For example, only 8.1 percent of rural women and 3.9 percent of those in the urban slums and fringes indicated that they used soap while washing their hands after defecation (see table 5.4).

Table 5.4

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY HAND WASHING PRACTICES AFTER DEFECATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Hand washing practices after defecation	Rural areas	Urban slums and fringes
Wash with:		
Soap	19.5	31.3
Ash	8.1	3.9
Soil	64.9	61.2
Leaves	0.2	0.2
Others	0.0	0.2
Wash without anything	5.9	3.0
Do not wash	1.3	0.2
Don't know	0.1	-
Total	100.0	100.0
N(1)	3734	120

(1) N is the weighted number of respondents, on which the estimate was based.

5.5. Impact of safe water, sanitation and hygienic practices

Differences in prevalence of diarrhoeal disease among children 5 years of age between the households using and not using water from the hand pump system are given in table 5.7, those between households having and not having latrines in table 5.8, and those for households classified by the respondents' hand washing practices in tables 5.9 to 5.11. The estimates of prevalence of diarrhoea for the urban slums and fringes were very unstable based on very small numbers of observations, for households not using water from the hand pump system, for those not having latrines, and for those with the respondents not reporting hand washing practices. Thus, great care should be taken in using these estimates for the analyses of impact concerning the water supply and sanitation programmes.

Table 5.5

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY HAND WASHING PRACTICES AFTER CLEANING UP THE BEHIND OF A CHILD, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Hand washing practices after cleaning up the behind of a child	Rural areas	Urban slums and fringes
Wash with:		
Just water	13.1	5.7
Water and mud	63.1	62.1
Water and ash	5.7	2.9
Water and soap	18.1	29.3
Total	100.0	100.0
N(1)	2341	74

(1) N is the weighted number of respondents, on which the estimate was based.

In general, prevalence of diarrhoeal disease among children under 5 years varied with age and was higher among those younger. Deviations for the general trend, notable in some rates, was plausibly because of erratic sampling fluctuations.

In any case, benefits of drinking water from the hand pump system were in clear evidence in the survey. As shown in table 5.7, among children in every age group under 5 years of age in households using water from the hand pump system at least for drinking purposes, the prevalence of two week diarrhoeal disease was lower than among those in households not using water from the hand pump system for any purpose. For example, for children aged less 12 months, the prevalence of two week diarrhoeal episodes was reported at 32.4 percent among rural households using water from the hand pump system compared to 41.9 percent for those among households not using water from the hand pump system. Similar variations were evidenced for rural children in the other age groups, save one exception notable for those in the 12-24 month age group plausibly because of the erratic sampling fluctuations. As stated earlier, for the urban slums and fringes the numbers of children for households not using water from the hand pump system were in general too small for every age group to draw any conclusion. Prevalence of diarrhoea among children had no clear patterns of relationship to households' possession of latrines even in the rural area(see table 6.8).

Table 5.6

PERCENTAGE DISTRIBUTION OF RESPONDENTS BY HAND WASHING PRACTICES BEFORE SERVING/TAKING FOODS, IN RURAL AREAS AND THE URBAN SLUMS FRINGES

Hand washing practices before serving/taking foods	Rural areas	Urban slums and fringes
Wash with:		
Just water	96.8	94.5
Water and soap	3.1	5.3
Don't wash	0.1	0.2
Total	100.0	100.0
N(1)	3734	120

(1) N is the weighted number of respondents in the sample,

Table 5.7

PERCENTAGE OF CHILDREN HAVING EVER HAD DIARRHOEAL EPISODES IN THE PREVIOUS TWO WEEKS BY AGE ACCORDING TO HOUSEHOLDS USING AND NOT USING WATER FROM THE HAND PUMP SYSTEM (HPS), IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Age	Households using water from HPS(1)	Households not using water from HPS(1)
Rural areas		
< 12	32.4(495)	41.9(50)
> 12 - <24	36.1(526)	30.9(45)
> 24 - <36	25.6(555)	32.3(62)
> 36 - <48	25.6(605)	36.6(52)
> 48 - <60	18.5(413)	29.2(33)
Total	27.9(2594)	34.5(243)
Urban slums and fringes		
< 12	43.2(15)	- (1)
> 12 - <24	44.3(21)	50.0(2)
> 24 - <36	30.2(22)	50.0(2)
> 36 - <48	10.5(18)	- (2)
> 48 - <60	19.4(10)	50.0(1)
Total	30.6(86)	35.5(7)

(1) Estimates are based on the weighted number of children. Figures within brackets give the weighted number of children enumerated in the specific category who were staying with respondents (mothers) at the time of interview.

Table 5.8

PERCENTAGE OF CHILDREN HAVING EVER HAD DIARRHOEAL EPISODES IN THE PREVIOUS TWO WEEKS BY AGE, ACCORDING TO HOUSEHOLDS HAVING AND NOT HAVING LATRINES IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Age	Having latrine(1)	Not having latrine(1)
Rural areas		
< 12 - Months	33.0(352)	33.9(193)
> 12 - <24 Months	34.4(364)	37.9(207)
> 24 - <36 Months	28.0(393)	23.3(224)
> 36 - <48 Months	26.5(400)	26.4(257)
> 48 - <60 Months	23.2(257)	14.1(188)
Total	29.3(1767)	27.2(1069)
Urban slums and fringes		
< 12 - Months	38.6(13)	49.7(4)
> 12 - <24 Months	47.0(19)	36.8(4)
> 24 - <36 Months	29.5(19)	38.6(4)
> 36 - <48 Months	10.6(16)	11.8(5)
> 48 - <60 Months	23.3(9)	- (2)
Total	30.7(75)	31.9(17)

(1) Estimates are based on the weighted number of children. Figures within brackets are the weighted number of children in the specific category who were staying with respondents (mothers) at the time of interview.

There were also no clear patterns of association emergent in the data between respondents' hand washing practices and the prevalence of diarrhoeal disease among their children under 5 years of age (see table 5.9 to 5.11. Lacking of any clear patterns of relationship is in part due to large sampling variability because of the small numbers of children covered in the different categories of the sample.

Table 5.9

PERCENTAGE OF CHILDREN HAVING EVER HAD DIARRHOEAL EPISODES IN THE PREVIOUS TWO WEEKS BY AGE AMONG HOUSEHOLDS ACCORDING TO HAND WASHING PRACTICES OF RESPONDENTS BEFORE SERVING/TAKING FOODS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Age of children	Wash with(1)		
	Water and soap	Just water	Don't wash
Rural areas			
< 12 months	48.7(14)	32.9(532)	-
> 12-< 24 months	23.2(20)	36.3(549)	0.0(2)
> 24-<36 months	20.9(8)	26.5(606)	0.0(3)
> 36-<48 months	13.6(23)	27.0(634)	-
> 48-<60 months	47.8(10)	18.6(437)	-
All	29.3(75)	28.5(2758)	0.0(5)
Urban slums and fringes			
< 12 months	0.0(1)	42.5(16)	-
> 12-< 24 months	0.0(1)	47.1(22)	-
> 24-<36 months	0.0(1)	32.8(21)	-
> 36-<48 months	-	11.0(20)	-
> 48-<60 months	-	22.9(11)	-
All	0.0(3)	31.1(90)	-

(1) Estimates are based on the weighted number of children. Figures within brackets are the weighted number of children in the specific category, who were staying with respondents (mothers) at the time of interview.

Table 5.10

PERCENTAGE OF CHILDREN HAVING EVER HAD DIARRHOEAL EPISODES IN THE PREVIOUS TWO WEEKS BY AGE AMONG HOUSEHOLDS ACCORDING TO HAND WASHING PRACTICES OF RESPONDENTS AFTER CLEANING UP THE BEHIND OF A CHILD, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Age of children	Wash with(1)		
	Water and ash/soap	Water and mud	Just water
	Rural areas		
< 12 months	30.2(149)	35.8(287)	35.6(91)
> 12-< 24 months	40.2(132)	34.1(366)	35.8(68)
> 24-<36 months	25.4(130)	27.3(401)	22.3(71)
> 36-<48 months	26.1(142)	26.1(428)	32.6(72)
> 48-<60 months	18.4(98)	18.2(276)	27.4(47)
All	28.6(651)	28.4(1758)	30.9(349)
	Urban slums and fringes		
< 12 months	21.5(5)	51.6(9)	50.0(2)
> 12-< 24 months	37.5(8)	50.0(14)	0.0(1)
> 24-<36 months	16.7(6)	36.8(15)	0.0(1)
> 36-<48 months	18.6(6)	8.5(12)	0.0(1)
> 48-<60 months	25.5(4)	22.1(5)	-
All	24.1(29)	34.5(55)	40.0(5)

(1) Estimates are based on the weighted number of children. Figures within brackets are the weighted number of children in the specific category, who were staying with respondents (mothers) at the time of interview.

Table 5.11

PERCENTAGE OF CHILDREN HAVING EVER HAD DIARRHOEAL EPISODE IN THE PREVIOUS TWO WEEK BY AGE AMONG HOUSEHOLDS ACCORDING TO HAND WASHING PRACTICES OF RESPONDENTS AFTER DEFECATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Age of children	Wash with(1)							
	Soap	Ash	Soil	Leaves	Others	Without anything	Does not wash	Don't know
<12 months	28.5 (116)	38.0 (41)	33.4 (341)	-	-	37.5 (46)	100.0 (1)	-
>12-<24 months	44.2 (94)	34.4 (41)	32.5 (381)	0.0 (1)	-	48.0 (48)	20.0 (5)	0.0 (1)
>24-<36 months	28.4 (96)	13.5 (38)	26.8 (427)	-	0.0 (1)	31.4 (45)	10.0 (10)	-
>36-<48 months	27.4 (123)	15.4 (51)	26.5 (434)	-	-	33.7 (44)	66.6 (3)	0.0 (1)
>48-<60 months	26.2 (85)	6.6 (37)	17.7 (295)	-	-	33.7 (27)	0.0 (3)	-
All	30.5 (514)	21.6 (208)	27.7 (1878)	0.0 (1)	0.0 (1)	37.1 (210)	22.7 (22)	0.0 (2)
<12 months	0.0 (1)	50.0 (8)	-	-	-	50.0 (2)	33.3 (6)	-
>12-<24 months	100.0 (1)	45.2 (14)	-	-	-	0.0 (1)	33.3 (6)	-
>24-<36 months	0.0 (1)	38.5 (14)	-	-	-	0.0 (1)	25.0 (8)	-
>36-<48 months	0.0 (1)	8.1 (13)	-	-	-	-	16.6 (6)	-
>48-<60 months	-	20.0 (5)	-	-	-	-	20.0 (5)	-
All	25.0 (4)	33.3 (54)	-	-	-	20.1 (5)	25.8 (31)	-

(1) Estimates are based on the weighted number of children. Figures within brackets are the weighted number of children in the specific category, who were staying with respondents (mothers) at the time of interview.

Chapter 6

HEALTH COMMUNICATION

Data on health communications in the survey were collected to ascertain

- extent of awareness about sources of health information;
- whether any messages currently delivered about the importance of tubewell water, hygienic latrines and hand washing in the target population;
- credible sources of providing messages on tubewell water, hygienic latrines, and hand washing practices;
- awareness about mentions relating to defecation practices, hygiene and hand washing practices, in the religion.

These data are considered necessary to design educational and motivational programmes towards improving the knowledge of, attitudes towards and uses of tubewell water and hygienic latrines. The programme would also include messages concerning hygienic practices.

6.1. Sources of health information

Unqualified practitioners were the most known source for health information among rural women (see table 6.1). When questioned about sources of seeking health information, 75 percent of respondents in the rural area mentioned those practitioners. Next most known sources for rural women were the upazila health complex followed by health/family planning workers and union health welfare centres. For women in the urban slums and fringes, the upazila health complex was the best source, followed by health/family planning workers, qualified doctors and unqualified doctors.

6.2. Messages as regards to water, sanitation and hygiene

Until the time the survey was undertaken, there were no large scale communication campaigns undertaken to disseminate information/knowledge about the importance of tubewell water, hygienic latrines and hygienic practices. Nevertheless, when respondents were asked about if they had learnt anything from anyone about the importance of tubewell water, hygienic latrine and hand washing in the previous three months, 7.4 percent of rural respondents and about 11 percent of respondents in the

urban slums and fringes mentioned that they did (see table 6.2). The more important finding was that a majority of those respondents mentioned health/family planning workers as a source of their awareness (table 6.3), thereby underscoring the importance of health/family planning workers as a major vehicle to disseminate any health related information in the target population. In addition, the school system (including school teachers and school students) scored high on the list.

Table 6.1

PERCENTAGE OF RESPONDENTS AWARE OF SPECIFIC SOURCES OF HEALTH INFORMATION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Sources	Rural areas(1)	Urban slums and fringes(1)
Upazila health complexes/ hospitals	48.0	62.5
Union health and family welfare centres	37.2	19.2
Unqualified practioners	74.9	45.8
Health/family planning workers	39.0	47.5
Neighbours	15.0	25.0
School teachers	1.4	-
Students(school going boys/girls)	0.8	-
Friends/relatives	0.9	0.8
Imams	0.2	-
Poster/hand bill	0.0	-
Union chairman	0.7	-
Union members/ward commissioners	0.7	-
NGO workers	1.0	2.5
Relatives	11.4	12.5
Qualified doctors	22.0	47.5
Others	7.0	15.8
N(2)	3734	120

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample.

Table 6.2

PERCENTAGE OF RESPONDENTS WHO HAD LEARNT ABOUT THE IMPORTANCE OF TUBEWELL WATER, HYGIENIC LATRINE AND HAND WASHING IN THE LAST THREE MONTHS, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Respondents who had	Rural areas(1)	Urban slums and fringes(1)
Learnt	7.4	10.8
Not learnt	92.6	89.2
Total	100.0	100.0
N(1)	3734	120

(1) N is the weighted number of respondents in the sample.

Table 6.3

PERCENTAGE OF RESPONDENTS BY SPECIFIC SOURCES THEY SAID THEY HAD LEARNT FROM ABOUT THE IMPORTANCE OF TUBEWELL WATER, HYGIENIC LATRINE AND HAND WASHING, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Sources	Rural areas(1)	Urban slums and fringes(1)
Health and family planning workers	46.6	46.2
DPHE workers	4.4	14.2
School teachers	8.6	20.9
School going boys/girls	15.2	23.0
Neighbours	27.0	46.2
Relatives	28.4	38.5
Doctors	34.1	30.8
Others	33.7	53.8
N(2)	277	13

(1) Percentages add to more than 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample, who had learnt about the importance of tubewell water, hygienic latrine and hand washing.

6.3. Credible sources

Among rural respondents, 13.8 percent and among respondents in the urban slums and fringes, 28.3 percent were found aware of mass media messages delivered in the previous one month, on immunization for children, tetanus shots for pregnant workers or rehydration therapy (see table 6.4). Those respondents were considered to be the most appropriate group to ask for opinions as regards credible sources of delivering information on tubewell water, hygienic latrines and hand washing practices. The majority of the respondents -- over 70 percent in the rural area and about 65 in the urban slums and fringes -- mentioned household visitation by field workers as a credible medium (see table 6.5). Radio and television appeared as the next most important credible sources. However, television was a choice noted in only 10 percent among rural respondents.

6.4. Awareness of mentions in religion

About fifty percent of rural respondents, with 43 percent of respondents in the urban slums and fringes, acknowledged that there were mentions about defecation practices in the religion (see table 6.6). Mentions concerning hand washing practices were also reported by large proportions, about 47 percent in the rural area and about 37 percent in the urban slums and fringes (see table 6.7). But it was only 30 percent of rural respondents who knew about mentions of hygiene in the religion, the percentage was even lower for the urban slums and fringes (see table 6.8).

Table 6.4

PERCENTAGE OF RESPONDENTS AWARE OF MASS MEDIA MESSAGES ON IMMUNIZATION FOR CHILDREN, TETANUS SHOTS FOR PREGNANT MOTHERS OR REHYDRATION THERAPY IN THE LAST ONE MONTH, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Respondents who were	Rural areas	Urban slums and fringes
Aware	13.8	28.3
Not aware	86.2	71.7
Total	100.0	100.0
N(1)	3734	120

(1) N is the weighted number of respondents in the sample.

Table 6.5

PERCENTAGE OF RESPONDENTS MENTIONING SPECIFIC MEDIA AS CREDIBLE SOURCES FOR MESSAGES ON TUBEWELL WATER, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Medium as credible sources	Rural areas(1)	Urban slums and fringes(1)
Household visit	71.5	64.7
Radio	28.7	23.5
Television	10.1	35.3
Cinema	0.8	-
Poster/Signboard/leaflet	2.1	2.9
Newspaper/magazine	3.1	2.9
Others	13.2	17.7
N(2)	516	34

(1) Percentage do not add up to 100.0 because of multiple responses.

(2) N is the weighted number of respondents in the sample who were aware about mass media messages on immunization for children, tetanus shots for pregnant mothers or oral rehydration therapy.

Table 6.6

PERCENTAGE OF RESPONDENTS BY AWARENESS OF 'MENTIONS ABOUT DEFECATION PRACTICES' IN THE RELIGION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Respondents who were	Rural areas	Urban slums and fringes
Aware of the mentions	50.9	42.7
Not aware of the mentions	26.7	28.4
Not certain	22.4	28.9
Total	100.0	100.0
N(1)	516	34

(1) N is the weighted number of respondents in the sample, who were aware about the mass media messages on immunization for children, tetanus shots for pregnant mothers or oral rehydration therapy.

Table 6.7

PERCENTAGE OF RESPONDENTS BY AWARENESS OF 'MENTIONS ABOUT HAND WASHING' IN THE RELIGION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Respondents who were	Rural areas	Urban slums and fringes
Aware of the mention	46.5	37.2
Not aware of the mention	24.0	24.5
Not certain	29.5	38.4
Total	100.0	100.0
N(1)	516	34

(1) N is the weighted number of respondents in the sample, who were aware about the mass media messages on immunization for children, tetanus shots for pregnant mothers or oral rehydration therapy.

Table 6.8

PERCENTAGE OF RESPONDENTS BY AWARENESS OF 'MENTIONS ABOUT HYGIENE' IN THE RELIGION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Respondents who were	Rural areas	Urban slums and fringes
Aware of the mention	29.7	22.1
Not aware of the mention	34.9	32.5
Not certain	35.4	45.4
Total	100.0	100.0
N(1)	516	34

(1) N is the weighted number of respondents in the sample, who were aware about the mass media messages on immunization for children, tetanus shots for pregnant mothers or oral rehydration therapy.

Reported specific mentions in religion, as regards to defecation practices are presented in table 6.9; those for hand washing practices in table 6.10, and those for hygiene in table 6.11. Specific religious mentions about defecation practices, most frequently quoted by the respondents, were 'one should use dila kulup after defecation', 'one should clean hands with soap/ash/soil after defecation', 'one should have Ozu after defecation', 'one should not defecate at an open place/should defecate, keeping up privacy/should defecate at a fixed place'. Important, reported religious mentions about hand washing were 'one should wash hand before taking food', 'one should clean hand with soap/with soap and soil. About hygiene, the respondents most frequently made the following statement without being specific. 'one should live/eat with cleanliness in order to remain in good health'.

Table 6.9

PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC MENTIONS ABOUT DEFECATION PRACTICES IN RELIGION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Specific mentions	Rural areas	Urban slums and fringes
To use dila kulup after defecation	35.5	49.4
To clean hands with soap/ ash/soil after defecation	25.9	17.8
To take Ozu after defecation	23.6	40.3
One should read Doa before and after defecation	22.8	26.8
To defecate, keeping up privacy/ not to defecate at an open place	20.7	15.3
One should defecate at a fixed place	12.6	7.8
To change clothes after defecation	6.4	7.2
To enter into latrine by left step and come out by right step	1.5	-
To cover head at the time of defecation	1.6	4.4
To take bath after defecation	1.8	9.0
Others	5.6	5.9
N(1)	263	14

(1) N is the weighted number of respondents in the sample, who were aware of the mentions about defecation practices in religion.

Table 6.10

PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC MENTIONS ABOUT HAND WASHING IN RELIGION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Specific mentions	Rural areas	Urban slums and fringes
One should:		
Wash hand before taking food	34.7	29.7
Wash hand before and after doing any work	30.2	28.0
Always clean hands with soap	29.7	38.0
Clean hand with soap and soil	18.7	14.5
Say Bismilla at the time of hand washing	9.7	14.4
Keep hands clean he/she and no diseases	8.4	-
Wash hand before serving food serving food	5.7	-
Others	4.8	2.7
N(1)	240	13

(1) N is the weighted number of respondents in the sample, who were aware of the mentions about hand washing in religious.

Table 6.11

PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC MENTIONS ABOUT HYGIENE IN RELIGION, IN RURAL AREAS AND THE URBAN SLUMS AND FRINGES

Specific mentions	Rural areas	Urban slums and fringes
To live/eat with cleanliness is a way to remain in good health	60.7	66.2
Health become sound if one practices religion	20.6	20.5
To eat/sleep/take bath on time	12.0	7.0
To have Ozu five times a day	9.1	10.7
Saying prayer five times a day is a good exercise	5.2	3.8
To wash hand before taking foods	2.9	-
To cleanse hand after defecation	4.0	-
To take nutritious foods	3.6	-
To take vegetables	1.6	-
To make latrine outside the house	0.7	-
Others	15.0	7.0
N(1)	153	7

(1) N is the weighted number of respondents in the sample, who were aware of the mentions about hygiene in religion.

Chapter 7

SUMMARY

The reporting National Survey was undertaken to conduct situation analysis pertaining to the water supply and sanitation sector in rural and urban slum areas of the country. Two samples were basically used to derive the objectives of the survey --- a tubewell sample and a household sample. The samples were constructed from a randomly selected representative area sample of 45 clusters of households. This report contains an analysis of the survey findings in six chapters covering the methodology of the survey; availability of hand pump systems and their conditions, coverages and accessibility; sanitation situations; health awareness and hygienic practices.

7.1. Hand pumps systems (HPSs)

The survey enumerated one HPS on average, for 6.6 households or 37.7 persons, in the rural area. For the urban slums and fringes the ratio was 4.5 households or 23.9 persons per enumerated HPS. Availability of HPSs was found relatively much less in the hilly region, stony region and the coastal belt. More than 10 households or 60 persons had to be listed on average to enumerate one HPS in those hydrogeological areas of the country, compared to fewer than, 7 households or 37 people in the other rural areas. Given ratios of households/people per enumerated HPS should not, however, be construed as a measure of the average number of people/households having access to water from a HPS.

Among enumerated HPSs in the rural area were 71 percent private HPSs and 29 percent public HPSs. In the urban slums and fringes, the ratio was 88 percent for private HPSs and 12 percent for public HPSs. Some of the public HPSs might have been misreported as private HPSs. But, in the rural area, the proportion of Public HPSs was at the most underreported by 3.7 points raising the proportion for private HPSs at the most from 67.3 percent to 71.0 percent. Extent of under-enumerations of public HPSs or of over-enumerations of public HPSs should be even less for the urban slums and fringes, given the fact that only a very small percentage of public tubewells were installed in those areas.

Most of the enumerated HPSs included tubewells, showing rare uses of ringwells and PSFs (Pond Sand Filters). Over 94 percent of tubewells were found to be operating at the time of the survey in the rural area and in the urban slums and fringes. There were, however, significant variations between the private and public tubewells. While only fewer than 5 percent of private

tubewells were found non-operational at the time of the survey, the percentage was almost double for public tubewells in the rural area and about 3 times for those in the urban slums and fringes.

With declining water table, some tubewells dry up and do not discharge water during the dry season. The problem starts with the Bangla month of Magh and continued until the end of Baishak. The number of affected HPSs peaked in Chaitra. All affected HPSs revert to their normal operational status after Baishak. Relatively more HPSs become non-functional in the rural area than in the urban slums and fringes. Declining water table was a more serious problem in the low water table and stony areas than anywhere else.

Except for rural public tubewells, a substantial number had no platforms, over 42 percent among public tubewells in the urban slums and fringes and over 57 percent among private tubewells in the urban slums and fringes and over 60 percent among those in rural areas. On the whole, platform conditions were also not adequate for public tubewells in the rural area, with only 70 percent of those having had the platform in good conditions. Among tubewells having platforms, a substantial number again had bad drainage systems resulting in pooling on the platform. Bad drainage systems were relatively more frequently observed among the public tubewells than among the private tubewells.

About 4 out of every 10 rural public tubewells had at least one part missing from the hand pump at the time of the survey. Proportions with missing parts were, however, relatively fewer among private tubewells compared to public tubewells, and among tubewells in the urban slums and fringes, compared to the rural area. Nut bolts holding the different components of the tubewells were the most frequently missing parts everywhere regardless of private or public tubewells, both in the rural areas and in the urban slums and fringes. There were also many tubewells having broken parts of varying degrees of importance. About 20 percent of rural public tubewells had at least one part broken at the time of the survey. Percentages with broken parts were slightly higher for rural private tubewells. On the overall, parts were found more likely to be broken among tubewells in the urban slums and fringes, compared to the rural area. Among the most frequently observed broken parts were bucket/washer and nut bolts.

Only about 20 percent of caretakers of public tubewells in the rural area reported to have received some training about how to repair/maintain the tubewell. For the urban slums and fringes the percentage was slightly higher as 26 percent. Although, there was no programme to impart training to owners of private tubewells, a small 4 to 5 percent of them reported that they had training on the repair/maintenance work relating to tubewells.

7.2. Coverage of, accessibility to and use of HPSs

In Bangladesh, most households in rural areas and in the urban slums and fringes, now have access to the HPS (hand pump system) at least for drinking water, 96 percent in the rural area and 94 percent in the urban slums and fringes. Most widely used HPSs were shallow tubewells covering 77 percent of households in the rural area and 88 percent in the urban slums and fringes. Deep tubewells were used by only 12 percent of households in the rural area and by only 3 percent in the urban slums and fringes. Coverages of other types of HPSs including Pond Sand Filters (PSFs) and Ringwells were extremely low.

Along with government's distribution of tubewells, sinking of private tubewells had a significant contribution in making the system universally accessible to people across the rural and the urban slum and fringe areas. In the rural area, private HPSs (49.2 percent) had almost equal coverages as had public HPSs (50.8 percent). In the urban slums and fringes, coverages of the private HPS were even more pronounced, with three out of every four user-households there depending on it. However, relative service coverage of a public hand pump system was much higher compared to the private hand pump system's. In the rural area were 10.8 households estimated to be served on average by a public tubewell compared to 4.4 households served by a private tubewell. For the urban slums the ratio was 9.4 households served by a public tubewell compared to 3.9 households served by a private tubewell. In terms of population, a public tubewell covered 60 persons in the rural area and 50 persons in the urban slums and fringes. The corresponding number for a private tubewell was 25 persons for rural areas and 21 persons for the urban slums and fringes.

With wide spread availability of HPSs, the vast majority of hand pump users, both in the rural area and in the urban slums and fringes, now have had HPS within a perceived distance of 150 metres. In the dry season, 85 percent of the households reported to be obtaining water from a HPS located at a perceived distance of 150 metres or less in the rural area and about 98 percent in the urban slums and fringes. Distance of the HPS increased in the wet season for some households.

With proximity to the HPS having improved significantly, 66.9 percent of the rural households reported that they were able to obtain water from it in 10 minutes or less in the dry season, with more than 40 percent spending only 5 minutes or less. For the urban slums and fringes the corresponding percentages were even higher, namely, 86.6 percent for 10 minutes or less and 66.8 percent for 5 minutes or less. On average, a household required 15 minutes in the rural area and 7 minutes in the urban slums and fringes to obtain water from the HPS in the dry season. However, time required in the rural area rose significantly in the wet season, upholding the increased inconveniences the rural households faced in obtaining water from the HPS during that season. There were, however, almost no variations between the

dry and wet seasons in the urban slums and fringes. As expected, users spent much less time when they obtained water from the private HPS than when they obtained water from the public HPS. The variations were, however, not as remarkable in the urban slums and fringes as in the rural area.

A household accessibility to the HPS increased with its socio-economic status. Rural households had an average perceived distance of 90 metres from the HPSs in the dry season if their family heads had never attended school or had an education less than the primary level. The average dropped to 75 metres for rural households with the family heads having completed primary education or above but less than the completed secondary education, and then to 52 metres for those with the family heads having completed secondary education or above. Similarly, the average perceived distance in the dry season varied for rural households by land ownership showing greater accessibility for those owning agricultural land than those not owning agricultural land, varied by households' possessions showing greater accessibility for those having more possessions than for those having fewer possessions, and varied by the roof type showing greater accessibility for households having concrete/tin on the roof of the main dwelling structure than those having mo concrete/tin on the roof of the main dwelling structure. Greater proximity to the HPS among households in the higher socio-economic status were also shown in the data for the urban slums and fringes.

Although households almost universally have access to the HPS, use of the full requirement of water from it still remains low. In the rural area, only 16.3 percent of households were found obtaining all the water they consumed from the HPS while a quarter of households kept their use of water from it limited to drinking only. Uses of the HPS for all the water needs were higher among urban slum households. But they too did not have more than 55 percent drawing the full requirement of water from the HPS.

Households using private HPSs were, however, more likely to draw their full requirement of water from the HPSs than were those using public HPSs. The differences were evident both in the rural area and in the urban slums and fringes. While in the rural area only 12 percent obtained the full requirement of water from the HPS among households using public HPSs, the proportion was almost double (23.6 percent) for those using private HPSs there. For the urban slum and fringe sample, proportions drawing full requirement of water varied from 39.3 percent for households using public HPSs to a higher 64 percent for those using private HPSs.

In response to the question about reasons for not using water from the HPS for all domestic purposes, 'One is to put in hard labour to obtain the full requirement of water from the system' was cited as a reason by 44 percent of respondents not using the full requirement of water from HPSs in the rural area

and by 51 percent in the urban slums and fringes. 'Tubewell is owned by other people' was another important reason reported by 39 percent in the rural area and 47 percent in the urban slums and fringes. 'Far away location of the system', and 'Required much time to obtain water' were also among important reasons given by the respondents. Easier access to the pond also worked as an inhibiting factor.

Although lack of adequate accessibility worked as a major obstacle, drawing of the full requirement of water was not appreciable even among households having the HPS within 50 metres, particularly, in the rural area. Only 24 percent obtained the full requirement from the HPS among rural households having the system within a perceived distance of 50 metres or less. In the urban slums and fringes, however, about 65 percent obtained the full requirement among households within 50 metres or less. A household was more likely to consume the full requirement from the HPS if it was from the higher socio-economic status than if it was from the lower socio-economic status.

Most known reasons for using water from the HPS were 'it prevents stomach disorder' and 'it prevents diarrhoea/cholera'. A small number of respondents were aware that water from the HPS might prevent other diseases as well. For example, only 29 percent of respondents in the urban slums and fringes knew that water from the HPS prevented skin diseases, while it was only 17.7 percent for those in the rural area. This explains why only a small proportion of households used the full requirement of water from the HPS.

7.3. Sanitation

Possession of latrines by households has risen significantly both in the rural areas and in the urban slums and fringes. In the rural area 61 percent of households now have latrines with 25.6 percent possessing a hygienic latrine. In the urban slums and fringes, proportions of households having latrines were even higher, with 83 percent possessing any type of latrine and 48 percent possessing a hygienic latrine.

Septic tank latrines, Water sealed latrines and Pit latrines were classified as the hygienic latrine. Other latrines such as Hanging latrines, Open latrines were considered as the un-hygienic latrine. In the rural area, most used hygienic latrines were pit latrines followed by water sealed latrines and Septic tank latrines in that order. Most used hygienic latrines in the urban slums and fringes were, on the other hand, the Water sealed latrines followed by Septic tank latrines and Pit latrines.

Possession of latrines varied by socio-economic status of households. A household was much more likely to have a latrine if it was from higher socio-economic status than if it was from lower socio-economic status. For example, while only 54 percent of rural households with the family head having never attended

school or having an education less than the primary level had the latrine, the percentage rose to 74 percent for those with the family head having completed primary education or more but less than the secondary level and then to over 83 percent for those having completed secondary education or above. Similarly, the proportion of households having households latrine varied by household possessions and by ownership of agricultural land. Close association of latrine possession with socio-economic status was also shown in the data for the urban slums and fringes.

Increases in the number of households latrines were a recent development as it appeared from the reported age of latrines. In the rural area, household latrines were on average 3.6 years old, with 36 percent of them being constructed in less than one year earlier than the interview date and another 24.7 percent being constructed one year to less than two years earlier. Households latrines in the urban slums and fringes had slightly higher average age than those of the rural area.

Among households having latrines, 91 percent of the respondents always used the latrine. About 8 percent of them sometime used it, while some (though fewer than one percent) never or rarely did it. On the overall, use of latrine by children still remains extremely low; fewer than 17 percent of respondents reported that children from their households used the latrine in the urban slums and fringes, while even fewer did in the rural area. Among boys the use of latrine was limited to only 41 percent of households in the rural area. Girls were much more likely to use the latrine. Girls were reported to be using latrines in 57 percent of households in the rural area and 87 percent in the urban slums and fringes. Adult males were much less likely to use latrines than were adult females. While females used latrines in 64.5 percent of households in the rural area, the proportion was only 55 percent for males there. Similar variations were apparent in the urban slums and fringes. On the overall, people were less likely to use latrines in the rural area than in the urban slums and fringes.

A half of the households had the latrine located inside the inner compound of the bari, both in the rural area and in the urban slums and fringes. But, about one third of the rural households with about a quarter of the households in the urban slums and fringes had it outside the outer compound. When a household latrine is placed outside the outer compound, accessibility to it is greatly hampered, particularly for women and girls.

Proximity of the latrine from the dwelling house was reported as 10 metres or less for slightly fewer than 50 percent of the rural households and for over 60 percent for the households in the urban slums and fringes households. Nevertheless, the average perceived distance from the dwelling house remained as 19 metres in the rural area and 13 metres in the urban slums and fringes, with some of the households having

their latrines located at a perceived distance of 20 metres from the dwelling house.

Awareness was high about hygienic latrines among women both in the rural area and in the urban slums and fringes. Among households having latrines in the rural area, 67 percent of respondents knew of water sealed latrines, and 60 percent of Septic tank latrines. Similar awareness of those latrines were noted among the respondents in the urban slums and fringes. But, awareness about Pit latrines was relatively less, mentioned by only 48 percent in the rural area and a fewer 41 percent in the urban slum and fringes. Most of the respondents were found to have the perception that either Septic tank latrines or water sealed latrines were the best type of latrines. Also among respondents not having household latrines, a high proportion was found aware of those as the hygienic latrines.

7.4. Awareness of hygienic practices

Several questions were asked in the survey to ascertain extent of health awareness among women in the survey population and to ascertain the levels of hygienic practices among themselves and their household members. Awareness of the relationship of tubewell water and sanitation with hygiene was found extremely low in the population although a significantly high percentage ascribed the benefits of tubewell water for health when interviewed in the context of tubewell. While asked about what a person need to follow to keep himself/herself healthy, only about three to four percent of respondents, both in the rural areas and in the urban slums and fringes, mentioned 'use tubewell water for all purposes'. Even 'drink tubewell water' was not mentioned by more than 16 percent among rural respondents and more than 30 percent among the urban slum and fringe respondents. 'Use latrine' was reported by only 6.6 percent among rural respondents and by only 11 percent among respondents in the urban slums and fringes. Spontaneous reporting of 'clean hands with soap or ash after defecation' was also not appreciable.

Awareness that drinking of contaminated water causes diarrhoea/stomach disorder were high among respondents. But, their awareness was astonishingly low about the other diseases caused by it. Only 5.9 percent of rural respondents and only 9.2 percent of respondents in the urban slums and fringes did know, for example, that contaminated water might be a cause of typhoid, while there was about none mentioning jaundice/hepatitis as a disease associated with 'using/drinking of contaminated water'.

Almost no respondent knew that indiscriminate defecation was a cause of worm infestation. Also, most respondents were found unaware that 'improper hand washing practices' and 'walking bare footed' may lead to worm infestation. Traditional beliefs that 'Taking of sugar/molasses causes worm infestation still persisted among over 8 out of every 10 women both in the rural area and in the urban slums and fringes.

Over 90 percent of respondents mentioned that they washed their hands after defecation, after cleaning up behind a child and before offering/taking foods. But it was only a small proportion found using soap in any case. For example, only 8.1 percent of rural women and 3.9 percent of women in the urban slums and fringes indicated that they used soap while washing their hand after defecation.

Impact of drinking water from the HPS was in clear evidence in the survey. Among children in every age group under 5 years of age in households using water from the HPS at least for drinking purposes, the prevalence of two week diarrhoeal disease was lower than among those in households not using water from the HPS for any purposes. Prevalence of diarrhoea among children had, however, no clear patterns of relationship to households' possession of latrines. A clear pattern of relation of the prevalence of diarrhoeal disease with hand washing practices was also not notable in the data.

7.5. Health communications

Data on health communication in the survey were collected to ascertain

- extent of awareness about sources of health information;
- whether any messages currently delivered about the importance of tubewell water, hygienic latrines and hand washing in the target population;
- credible sources of providing messages on tubewell water, hygienic latrines, and hand washing practices;
- awareness about mentions relating to defecation practices, hygiene and hand washing practices, in the religion.

Unqualified practitioners were the most known source for health information, among rural women. When questioned about sources of seeking health information, 75 percent of respondents in the rural area mentioned those practitioners. Next most known sources for rural women were the upazila health complex followed by health/family planning workers and union health welfare centres. For women in the urban slums and fringes, the upazila health complex was the best source, followed by health/family planning workers, qualified doctors and unqualified doctors.

Until the time the survey was undertaken, there were no large scale communication campaigns undertaken to disseminate information/knowledge about the importance of tubewell water, hygienic latrines and hygienic practices. Nevertheless, when respondents were asked about if they had learnt anything from

anyone about the importance of tubewell water, hygienic latrine and hand washing in the previous three months, 7.4 percent of rural respondents and about 11 percent of the urban slums and fringes respondents mentioned that they did. The more important finding was that a majority of those respondents mentioned health/family planning workers as a source of their awareness, thereby underscoring the importance of health/family planning workers as a major vehicle to disseminate any health related information in the target population. The potential of the school system was also quite evident. Data also showed that, household visitation by field workers was viewed by the respondents as a credible medium to disseminate knowledge/information about the importance of tubewell water, hygienic latrines and hand washing practices in the population. Radio and television appeared as the next most important credible sources.

Appendix-A

CLASSIFICATION OF UPAZILAS

Major classification	Sub-classification			ALL
	LWT	SWT	LWT\SWT	
1. LWT/SWT AREAS	79	183	57	319
2. COASTAL AREAS	21	23	31	75
3. URBAN SLUMS AND FRINGE AREAS	9	14	9	32
4. STONY AREAS	4	13	2	19
5. HILLY AREAS	16	7	2	25
TOTAL	129	240	101	470

LISTING OF UPAZILAS CONSTITUTING THE LOW WATER TABLE (LWT) STRATUM, THE SHALLOW WATER TABLE (SWT) STRATUM AND THE LOW WATER/ SHALLOW WATER TABLE STRATUM

Low water Table	Shallow water Table	LW/SW Table
01 Dhaka Division		
1. Shibalaya	1. Harirampur	1. Dhamrai
2. Daulatpur	2. Ghior	2. Savar
3. Manikganj(s)	3. Saturia	3. Narayanganj(s)
4. Tejgaon	4. Singair	4. Palash
5. Kapasia	5. Keraniganj	5. Shibpur
6. Kaliganj	6. Nawabganj	6. Balabo
7. Gazipur(s)	7. Dohar	7. Monohardi
8. Sreepur	8. Sree Nagar	
9. Kaliakair	9. Serajdikhan	
	10. Lohajang	
	11. Tongibari	
	12. Munsiganj	
	13. Gajaria	
	14. Bandar	
	15. Sonargaon	
	16. Arihazar	
	17. Rupganj	
	18. Narsingdi(s)*	
	19. Raipura	
02 Tangail Division		
10. Bashail	20. Nagarpur	
11. Sakhipur	21. Tangail(s)	8. Mirjapur
	22. Delduwar	9. Kalihati
	23. Bhuapur	10. Ghatail
	24. Gopalpur	11. Madhupur
03 Mymensingh Division		
12. Haluaghat	25. Pakundia	12. Tarail
13. Fulpur	26. Katiadi	13. Purbadhala
14. Mymensingh(s)*	27. Kuliarchair	14. Durgapur
15. Muktagacha	28. Bhairab	
16. Fulbaria	29. Astogram	
17. Bhaluka	30. Nikli	
18. Gafargaon	31. Mithamoin	
19. Trishal	32. Karimganj	
20. Gouripur		

Low water Table	Shallow water Table	LW/SW Table
21. Ishwarganj	33. Itna	
22. Nandail	34. Kaliajuri	
23. Hossainpur	35. Madan	
24. Bajitpur	36. Kendua	
25. Kishoreganj	37. Mohonganj	
26. Atpara	38. Netrokona(s)	
27. Barhatta	39. Kalmakanda	
28. Dhubaura		
04 Jamalpur Division		
	40. Sharishabari	15. Jamalpur(s)
	41. Madarganj	16. Melaudah
	42. Islampur	17. Dewanganj
	43. Bakshiganj	18. Sribardi
		19. Sherpur
		20. Nakla
09 Comilla Division		
	44. Nasirnagar	21. Brahmanbaria(s)*
	45. Sharail	
29. Akhaura	46. Kosba	
30. Comilla(s)	47. Nabinagar	22. Burichong
	48. Bancharampur	
	49. Homna	
	50. Daudkandi	
	51. Muradnagar	
	52. Debidwar	
	53. Brahmanpara	
	54. Choudygram	
	55. Nangolkot	
	56. Laksham*	
	57. Barura	
	58. Chandina	
	59. Kachua	
	60. Matlab	
	61. Chandpur	
	62. Hajiganj	
	63. Shahrasti	
	64. Faridganj	
	65. Haimchar	

Low water Table	Shallow water Table	LW/SW Table
11 Sylhet Division		
	66. Dharmapasha	23. Sylhet(s)*
	67. Sulla	
	68. Dirai	
	69. Jamalganj	
	70. Bishwamvarpur	
	71. Sunamganj(s)	
	72. Chatak	
	73. Jagannatpur	
	74. Balaganj	
	75. Biswanath	
	76. Companiganj	
	77. Zakiganj	
	78. Beani Bazar	
	79. Golapganj	
	80. Fenchuganj	
	81. Kamalganj	
	82. Srimongol	
	83. Moulavibazar	
	84. Nabiganj	
	85. Baniachang	
	86. Ajmiriganj	
	87. Lakhai	
	88. Hobiganj(s)*	
	89. Bhuwbal	
	90. Madhabpur	
12 Rajshahi Division		
31. Baraigram		24. Lalpur
32. Bagatipara		25. Shibganj
33. Natore(s)*		26. Godagari
34. Gurudaspur		27. Puthia
35. Singra		28. Paba
36. Atrai		29. Charghat
37. Raninagar		30. Bagha
38. Naogaon*		
39. Badalgachi		
40. Bhamoirhat		
41. Mohadebpur		
42. Manda		
43. Niamatpur		
44. Gomostapur		
45. Bholahat		
46. Nachole		
47. Nawabganj(s)		
48. Tanore		
49. Mohonpur		
50. Bagmara		
51. Durgapur		

Low water Table	Shallow water Table	LW/SW Table
13 Bogra Division		
52. Khetlal	91. Sonatola	31. Panchbibi
53. Akkelpur	92. Sariakandi	32. Joypurhat(s)
54. Kalai	93. Gabtoli	33. Bogra(s)*
55. Shibganj		34. Dhunat
56. Kahaloo		
57. Dubchachia		
58. Adamdighi		
59. Nandigram		
60. Sherpur*		
14 Pabna Division		
61. Royganj	94. Kazipur	35. Shahjadpur
62. Tarash	95. Sirajganj(s)*	36. Bera
63. Ullahpara	96. Kamarkhand	
64. Sujanagar	97. Belkuchi	
65. Shanthia	98. Chowhali	
66. Faridpur		
67. Bhangura		
68. Chatmohor		
69. Atghoria		
70. Pabna(s)		
71. Ishwardi*		
15 Rangpur Division		
	99. Domar	37. Badarganj
	100. Dimla	38. Pirganj
	101. Jaldhaka	39. Polashbari
	102. Nilphamari(s)	40. Gobindaganj(s)
	103. Kishoreganj	
	104. Syedpur	
	105. Patgram	
	106. Hatibandha	
	107. Kaligon	
	108. Aditmari	
	109. Lalmonirhat(s)	
	110. Fulbari	
	111. Burangamari	
	112. Nageshwari	
	113. Kuricgram(s)*	
	114. Rajarhat	
	115. Ulipur	
	116. Chilmari	
	117. Raumari	
	118. Rajibpur	
	119. Pirgacha	
	120. Kawnia	

Low water Table	Shallow water Table	LW/SW Table
	121. Gangachara	
	122. Taraganj	
	123. Rangpur(s)*	
	124. Mithapukur	
	125. Pirganj	
	126. Sundarganj	
	127. Sadullapur	
	128. Gaibandha(s)	
	129. Fulchari	
	130. Saghata	
16 Dinajpur Division		
72. Parbatipur	131. Baliadangi	41. Birganj
73. Fulbari	132. Thakurgaon(s)	42. Biral
74. Nawabganj	133. Ranisankail	43. Dinajpur(s)*
75. Ghoraghat	134. Haripur	44. Hakimpur
	135. Pirganj	
	136. Bochaganj	
	137. Kararole	
	138. Khansama	
	139. Chirirbandar	
	140. Birampur	
18 Jessore Division		
	141. Mohespur	45. Shoilkupa
	142. Kotchandpur	46. Sreepur
	143. Kaliganj	47. Jessore(s)
	144. Jhenaidah(s)*	48. Sharsha
	145. Horinakunda	49. Jhikorgacha
	146. Magura(s)*	
	147. Mohammadpur	
	148. Shalikha	
	149. Lohagora	
	150. Kalia	
	151. Narail(s)	
	152. Bagharpara	
	153. Avoynagar	
	154. Chowgacha	
	155. Monirampur	
	156. Keshabpur	

Low water Table	Shallow water Table	LW/SW Table
19 Kushtia Division		
76. Khoksa	157. Daulatpur	50. Bheramara
77. Kumarkhali	158. Gangni	51. Mirpur
	159. Alamdanga	52. Kushtia(s)*
	160. Jibannagar	53. Meherpur*
		54. Damurhuda
		55. Chuadanga(s)*
20 Faridpur Division		
78. Pangsha	161. Kotalipara	56. Modhukhali
79. Rajbari(s)*	162. Tongipara	57. Baliakandi
	163. Gopalganj(s)*	
	164. Kashiani	
	165. Muksurpur	
	166. Rajoir	
	167. Madaripur(s)	
	168. Kalkini	
	169. Shibchar	
	170. Jazira	
	171. Shariatpur(s)	
	172. Goshairhat	
	173. Damuddya	
	174. Bhedarganj	
	175. Naria	
	176. Bhanga	
	177. Sadarpur	
	178. Char Bhadrason	
	179. Faridpur(s)	
	180. Nagarkanda	
	181. Alfandanga	
	182. Boalmari	
	183. Goalonda	

LISTING OF UPAZILAS CONSTITUTING WITH THE STRATUM OF COASTAL AREAS BY VARIATIONS OF WATER TABLE

Low water Table	Shallow water Table	LW/SW Table
05 Chittagong Division		
	1. Mirsharai	1. Patiya*
	2. Boalkhali	2. Sandwip
	3. Anwara	3. Sitakunda
	4. Satkania	4. Chandanaish
	5. Teknaf	5. Banshkhali
	6. Kutubdia	6. Chakaria
	7. Mohoeshkhali	7. Cox's bazar(s)*
10 Noakhali Division		
		8. Laksmipur(s)
		9. Ramgati
	8. Hatia	10. Noakhali(s)
	9. Sonagazi	11. Begumganj
	10. Feni(s)	12. Companiganj
		13. Parshuram
		14. Chagalnaiya
17 Khulna Division		
1. Koyra	11. Debhata	15. Asasuni
2. Mongla	12. Bagerhat(s)	16. Kaliganj
	13. Morelganj	17. Shyamnagar
		18. Paikgacha
		19. Dacope
		20. Batiaghata
		21. Rampal
		22. Sarankhola
21 Barisal Division		
3. Charfasson	14. Hizla	
4. Monpura	15. Mehendiganj	
5. Lalmohan	16. Muladi	
6. Tajumuddin	17. Agailjhara	
7. Burhanuddin	18. Barisal(s)*	
8. Daulatkhan	19. Pirojpur(s)	
9. Bhola(s)	20. Kawkhali	

Low water Table	Shallow water Table	LW/SW Table
10. Matbaria	21. Nazirpur	23. Gaurnadi
	22. Sarupkati	24. Ujirpur
	23. Banaripara	25. Babuganj
		26. Bakerganj
		27. Nalchiti
		28. Jhalokati(s)
		29. Rajapur
		30. Kathalia
		31. Bhandaria

22 Patuakhali Division

11. Patharghata
12. Bamna
13. Betagi
14. Borguna
15. Amtali
16. Kalapara
17. Galachipa
18. Dashmina
19. Mirjaganj
20. Patuakhali(s)*
21. Bauphal

LISTING OF UPAZILAS UNDER WITH THE STRATUM OF
URBAN SLUMS AND FRINGE AREAS BY
VARIATION OF WATER TABLE

Low water Table	Shallow water Table	LW/SW Table
01 **Dhaka Division**		
	1. Narshingdi	
03 **Mymensingh Division**		
1. Mymensingh*	2. Netrakona*	
2. Muktagacha(S)*		
3. Kishoreganj		
05 **Chittagong Division**		
	3. Patiya*	
	4. Cox's Bazar*	
09 **Comilla Division**		
	5. Laksham*	
		1. Bramanbaria*
11 **Sylhet Division**		
		2. Sylhet*
	6. Hobiganj*	
12 **Rajshahi Division**		
		3. Rajshahi
4. Natore*		
5. Noagaon*		
		4. C. Nawabganj
13 **Bogra Division**		
		5. Bogra*
6. Sherpur*		
14 **Pabna Division**		
7. Ishawardi*		
	7. Serajganj*	

Low water Table	Shallow water Table	LW/SW Table
15 Rangpur Division		
	8. Rangpur*	
	9. Kurigram*	
16 Dinajpur Division		
		6. Dinajpur*
17 Khulna Division		
8. Khulna		
18 Jessore Division		
	10. Jhenaidah*	
	11. Magura*	
19 Kushtia Division		
		7. Kushtia*
		8. Chuadanga*
		9. Meherpur*
21 Barisal Division		
	12. Barisal*	
20 Faridpur Division		
	13. Gopalganj*	
9. Rajbari*		
22 Patuakhali Division		
	14. Patuakhali*	

LISTING OF UPAZILAS CONSTITUTING THE STRATUM OF STONY AREAS BY WITHIN VARIATIONS OF WATER TABLE

Low water Table	Shallow water Table	LW/SW Table
04 **Jamalpur Division**		
1. Jinaigati 2. Nalitabari		
11. **Sylhet Division**		
	1. Kanaighat 2. Gowinghat 3. Jaintapur 4. Chunarughat	
		1. Barlekha
	5. Kulaura 6. Rajanagor 7. Tahirpur 8. Dwarabazar	
12. **Rajshsahi Division**		
		2. Patnitala
3. Sapahar 4. Porsha		
16 **Dinajpur Division**		
	9. Panchogaor(s) 10. Boda 11. Tetulia 12. Atwari 13. Debiganj	

LISTING OF UPAZILAS CONSTITUTING THE STRATUM OF HILLY AREAS BY WITHIN VARIATIONS OF WATER TABLE

Low water Table	Shallow water Table	LW/SW Table

06. **Rangamati Division**

Low water Table	Shallow water Table	LW/SW Table
1. Rajasthali		
2. Kaptai		
3. Kawkhali (Rang)		
4. Rangamati(s)		
5. Belaichhari		
6. Juraichhari		
7. Barkal		
8. Longdu		
9. Naniarchar		
10. Bagaichari		

07. **Khagrachari Division**

Low water Table	Shallow water Table	LW/SW Table
11. Laksmichari	1. Khagrachari(s)	
12. Manikchari	2. Mohalchari	
	3. Ramgar	
	4. Matiranga	
	5. Panchari	
	6. Dighinala	

08. **Bandarban Division**

Low water Table	Shallow water Table	LW/SW Table
13. Alikadam	7. Nakhyangchari	1. Lama
14. Thanchi		2. Bandarban(s)
15. Ruma		
16. Rowangchhari		

Appendix B

Sample Design

1. Sample

The survey was carried over three samples, a cluster sample, a tubewell sample, and a household sample. In the rural area, a cluster was usually equivalent to one village or more or some time, part of a village. Among urban slums, it covered a artificially constructed block of households. The cluster sample was employed to estimate the coverage of tubewells. In each of the sampled clusters, all tubewells and all households were listed. Tubewells and other hand pump systems were listed by type (Government or private) and operating status, while households were listed along with census of members usually living in a household. The cluster sample was needed to assess the ratio of population/households to hand pump systems. The tubewell sample was employed to ascertain relevant parameters to ascertain conditions of tubewells, contributions made for installation of tubewells, maintenance of tubewells, conditions of platforms, conditions of drainage, levels of discharge, chemical quality of water, etc. The household sample was employed to derive the survey estimates concerning both the households and the individuals.

2. Sample sizes

Precisions of estimates obtained from a sample depend, among other things, on the size of the sample. Precision of an estimate is defined as the amount of tolerated errors in the estimate and is usually expressed in terms of its Standard Error (SE) in the sample. The smaller is the standard error of an estimate, the greater is its precision. Thus, the size of a sample is often determined by taking into account the expected standard error for an estimate to be derived from the sample. Usually, the size of a sample is worked out in reference to the standard error of the most important parameter(s) to be estimated from the sample.

The sizes of the tubewell sample and household sample were worked out by using the following formula, as they were drawn by using the area sampling technique.

$$n = \frac{p\,(1 - p)\,.\,(\text{Deff})}{\text{SE}} \qquad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

where

(i) p is an approximate value of the parameter to be estimated

(ii) SE is the standard error expected to be associated with the estimate of the parameter

(iii) Deff is the design effect. Deff is the ratio of the two variance estimates; the estimate drawn from other than the SRS sample, divided by the estimate of an SRS sample of the same size (n)

Proportions of operating tubewells and proportions of households using water from tubewells (at least for drinking purposes) were among the important parameters generated from the survey. As such, the sizes of the samples were developed, inputting the assumed values of those two parameters in the given equation. Our assumptions were that if the survey was successful in providing reliable estimates for the proportion of operating tubewells and of households using water (at least for drinking purposes) from tubewells, it would also be successful in providing reliable estimates for the other parameters.

Assuming that about 90 percent of tubewells remained operational any time and about 82 percent of households used water (at least for drinking purposes) from tubewells, it was calculated that the tubewell sample should cover a minimum of 1800 tubewells and the household sample a minimum of 4500 households in order to provide estimates of the two parameters with the standard error (SE) of .01. Given sizes were arrived at, by assuming Deff=2 for the tubewell sample and Deff=3 for the household sample.

The cluster sample was comprised of 45 clusters, with each cluster containing about 500 households. The household sample was formed by including 100 households from each of the clusters. The number of 45 clusters for the cluster sample was decided based on the following consideration. 'Within cluster' variations could be safely ignored for estimates from the household sample if data were gathered from 100 households. Moreover, national surveys done in the past with samples developed from 40-50 clusters were successful in providing reliable estimates pertaining to the national population. Geographical spread of the cluster sample is shown on the country map furnished on page ..... of the text.

3. Drawing of samples

The survey universe covering the water supply and sanitation sector in the rural and urban slum areas was defined in terms of 7 strata based on hydrogeological classification of the country, namely, Shallow Water Table (SWT) areas, Low Water Table (LWT) areas, SWT/LWT areas, Coastal belt, Hilly regions, Stony regions and Urban slums (including fringes). Upazilas fully or almost fully consisting of SWTs were placed in the SWT stratum.

Similarly, upazilas fully or almost fully consisting of LWTs were placed in the LWT stratum. The remaining upazilas containing both the shallow or low water tables were allocated to the SWT/LWT stratum. The Stony region stratum was constructed including all the upazilas belonging to that region. Similarly, the Coastal belt stratum and Hilly region stratum were constructed. The urban slum stratum was developed including all the pourasavas under the water supply and sanitation programme. Appendix B contains listing of upazilas by specific strata.

The area sample was drawn by developing the frame with census villages enumerated in the 1986 economic census. Within each stratum, clusters were selected by employing a systematic sampling technique. In each cluster, households into the household sample were selected by choosing 100 households from the constructed list of households for the cluster.

All existing tubewells in each of the clusters were included in the tubewell sample. According to data provided in the survey's Terms of Reference (TOR), there were about 15,16,000 tubewells (including both private and government) in the country, at the time the survey proposal was developed. With a total population of 110 million in the country and with 5.7 persons living in an average household, the figure of 15,16,000 tubewells meant that there was, on average, one tubewell available per 13 households. By this account, the cluster sample was estimated to contain at least 1800 tubewells required for the tubewell sample.

NATIONAL SURVEY ON STATUS OF WATER SUPPLY AND SANITATION

Selected Upazilas by Strata

PSU No.	District	Upazila	No.of listed HHs.	Total popu-lation	No.of public tubewell	No.of any tubewell
		Stratum - I : SWT AREAS				
01.	Dinajpur	Chirirbandar	425	2295	16	106
02.	Kurigram	Nageswari	423	2200	13	133
03.	Gaibandha	Sadullapur	558	2540	27	119
04.	Chuadanga	Alamdanga	504	2505	34	71
05.	Narail	Narail Sadar	501	2813	25	45
06.	Madaripur	Shibchar	410	2268	20	130
07.	Dhaka	Nawabgonj	404	2590	16	71
08.	Narshingdi	Narshingdi	414	2205	6	100
09.	Kishoregonj	Karimgonj	470	2263	20	47
10.	Sunamgonj	Sunamgonj (S)	481	2856	15	16
11.	Hobigonj	Hobigonj Sadar	446	2381	22	35
12.	Comilla	Debidwar	605	3872	28	65
13.	Chandpur	Kachua	413	2716	23	87
14.	Chittagong	Fatikchhari	406	2663	25	121
Sub-total			6460	36167	290	1146

PSU No.	District	Upazila	No.of listed HHs.	Total popu-lation	No.of public tubewell	No.of any tubewell
		Stratum - II : LWT AREAS				
15.	Bogra	Kahaloo	472	2104	11	128
16.	Nawabgonj	Bholahat	484	2765	28	45
17.	Serajgonj	Ullapara	540	3136	21	68
18.	Rajbari	Pangsha	491	2860	33	55
19.	Mymensingh	Gafargaon	650	3337	19	54
20.	Mymensingh	Gauripur	514	2617	26	89
Sub-total			3151	16819	138	439
		Stratum - III : LWT/SWT AREAS				
21.	Jaypurhat	Joypurhat (S)	449	2012	16	126
22.	Pabna	Bera	396	2242	28	82
23.	Faridpur	Madhukhali	398	2099	25	76
24.	Tangail	Madhupur	506	2359	25	72
25.	B. Baria	B. Baria Sadar	437	2646	21	51
Sub-total			2186	11358	115	407
		Stratum - IV : COASTAL AREAS				
26.	Satkhira	Shyamnagar	475	2654	3	03
27.	Patuakhali	Bauphal	514	3423	11	11
28.	Barguna	Betagi	451	2662	15	27
29.	Jhalakhathi	Nalchity	556	3082	23	23
30.	Laxmipur	Ramgati	412	2552	24	31
31.	Chittagong	Mirshwarai	441	2823	18	114
32.	Cox's Bazar	Cox's Bazar	517	3278	18	22
Sub-total			3366	20474	112	231

PSU No.	District	Upazila	No.of listed HHs.	Total popu-lation	No.of public tubewell	No.of any tubewell
Stratum - V : STONY AREAS						
33.	Panchagarh	Panchagarh(S)	410	1965	9	21
34.	Sherpur	Nallitabari	405	1739	17	52
35.	Sunamgonj	Tahirpur	400	2211	13	13
36.	Maulvibazar	Rajnagar	464	2930	28	37
37.	Hobigonj	Chunarughat	399	2200	27	33
Sub-total			2078	11045	94	156
Stratum - VI : HILLY AREAS						
38.	Khagrachari	Ramgarh	485	2812	49	66
39.	Rangamati	Bagaichari	394	2334	27	30
40.	Bandarban	Ruma	322	1851	22	22
Sub-total			1201	6997	98	118
Stratum - VI : URBAN SLUMS AND FRINGE AREAS						
41.	Rangpur	Rangpur Sadar	482	2571	4	176
42.	Serajgonj	Serajgonj (S)	487	2573	19	133
43.	Khulna	Khulna Sadar	511	2491	19	47
44.	Narsingdi	Narsingdi (S)	484	2716	10	109
45.	Sylhet	Sylhet Sadar	502	2752	13	84
Sub-total			2466	13103	65	549
Total			20908	115963	912	3046

Appendix D

THE NATIONAL SURVEY ON STATUS OF RURAL WATER SUPPLY AND SANITATION

Interview Schedule

MITRA AND ASSOCIATES
2/17, Iqbal Road, Mohammadpur
Dhaka-1207, Bangladesh

HOUSEHOLD PART

SAMPLE IDENTIFICATION

NAME OF HOUSEHOLD HEAD_____

OCCUPATION OF HOUSEHOLD HEAD_____

SAMPLE H.H.NO. | | | | CONVERTED H.H.NO. | | | | |

District_____ Upazila/Thana _____

Union _____ Village/Mohalla/Block _____

Stratum | | | | PSU | | |

INTERVIEW INFORMATION

Interview call	1	2	3	4
Date				
Result Code*				

Interviewer Code | | |

*RESULT CODE:

Completed	1	Dwelling vacant	5
No competent Respondent	2	Address not found	6
Deferred	3	Address not existing	7
Refused	4	Others (Specify)_____	8

Scrutinized | |

By | | | | |

Date _____

Reinterviewed or spot checked | |

By | | | | |

Date_____

Batch No._____

HOUSEHOLD MEMBERS

Please tell the names of all members (including very small babies) who usually live in this household. I request you tell first the names of female members, and then the names of male members.

Female members

Line #	Name of women	How old is she (completed year)	Has she ever been married ? Yes / No	Interview eligibility (Please Tick)
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				

Identification number of selected respondent:_____

Male members

Line #	Name of men	How old is he (completed year)
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		

INDIVIDUAL PART

Village or Mohalla _____ Time Started _____

Converted H.H. Serial Number | | | | | | |

Line No. of Respondent | | |

INTERVIEW INFORMATION

Interview Call	1	2	3	4
Date				
Result Code*				
Interviewer's Code Number				

*INTERVIEWER: For each call, enter the appropriate result code as follows.

Completed	1
Incomplete	2
Respondent not available	3
Deferred	4
Refused	5
Others (Specify)	8 _____

Scrutinized | | Reinterviewed or spot checked | | Edited | | Coded | |

By | | | | By | | | | By | | By | | |

Date_____ Date_____ Date_____ Date_____

Section 1

Individual Characteristics

101. How old are you?

Age _____ (Completed year)

102. Now, I would like to know about your marital status. Are you currently married, widowed, divorced, separated or deserted?

¦ 1 ¦	Currently married	¦ 2 ¦	Widow
¦ 3 ¦	Divorced	¦ 4 ¦	Separated
¦ 5 ¦	Deserted		

103. Have you ever given birth?

¦ 1 ¦	Yes	¦ 2 ¦	No

(SKIP TO 105)

104. How many living children do you have now?

Total Children _____ Son(s) _____ Daughter(s)_____

105. Did you ever attend school?

¦ 1 ¦	Yes	¦ 2 ¦	No

(SKIP TO 108)

106a. Was it a primary school, madrasa, secondary school or higher?

¦ 1 ¦	Primary school	¦ 2 ¦	High school
¦ 3 ¦	College/University	¦ 4 ¦	Madrasa
¦ 5 ¦	Others _____ (specify)		

106b. For how many years did you go to school?

_____

107. What was the highest class you passed?

_____ class

108. Apart from doing normal household work, do you do any other work (for cash or kind) on a regular basis, such as agricultural work, making things (for sale), selling things in the market, or anything else?

¦ 1 ¦	Yes	¦ 2 ¦	No

(SKIP TO 110)

109. Did you earn any cash income, doing such work during the last year?

¦ 1 ¦	Yes	¦ 2 ¦	No

110. Many women work as Ansar-VDP, school teachers and health workers. Do you do any such work?

¦ 1 ¦	No	¦ 2 ¦	Ansar-VDP
¦ 3 ¦	School teachers	¦ 4 ¦	Health workers

111. What is your religion?

¦ 1 ¦	Islam	¦ 2 ¦	Hinduism
¦ 3 ¦	Christianity	¦ 4 ¦	Buddhism
¦ 5 ¦	Others _____ (specify)		

Section 2

Water and Sanitation

201a. From where does your household usually obtain drinking water?

1	Tara	2	Shallow tubewell (drinking water)
3	Deep tubewell (drinking water)	4	Shallow tubewell (Agriculture)
5	Deep tubewell (Agriculture)	6	PSF(Pond Sand Filter)
7	River (SKIP TO 214a)	8	Pond (SKIP TO 214a)
9	Ringwell (SKIP TO 214a)	10	Chara (SKIP TO 214a)
11	Canal (SKIP TO 214a)	12	Others _____ (Specify) (SKIP TO 214a)

201b. Is there iron removal plant (IRP) on the tubewell?

1	Yes	2	No

201c. Do you usually collect water from the tubewell?

1	Yes	2	No

202a. Is it a community tubewell or private tubewell?

1	Community tubewell (SKIP TO 202c)	2	Private tubewell

202b. Whose tubewell is this?

¦ 1 ¦	Owned by self	¦ 2 ¦	Owned in partnership with others
¦ 3 ¦	Some one else in the bari	¦ 4 ¦	Neighbours
¦ 5 ¦	Others_____ (Specify)		

(SKIP TO 203a)

202c. Who has provided the tubewell?

¦ 1 ¦	Government	¦ 2 ¦	NGO _____ (Specify)
¦ 3 ¦	Others _____ (Specify)		

202d. (Interviewer: If Grameen Bank is mentioned, ask:) Is it purchased?

¦ 1 ¦	Yes	¦ 2 ¦	No

203a. Where is the tubewell located?

¦ 1 ¦	Inside bari	¦ 2 ¦	Outside bari
¦ 3 ¦	Inside neighbour's bari	¦ 4 ¦	Other places_____ (Specify)

203b. (Interviewer: Check 202a; If community tubewell, ask:) Is it the caretaker's house?

¦ 1 ¦	Yes	¦ 2 ¦	No

204a. How was the site of the tubewell decided?

1	Decided by DPHE people	2	Decided by UP chairman/member
3	Decided by joint consultation with prospective users	4	Decided by local leaders to their convenience
5	Decided by the owner/caretaker	6	Others _____ (Specify)
7	Don't know		

204b. Were you yourself involved in selection of the site?

1	Yes	2	No (SKIP TO 205a)

204c. How were you involved? (PROBE)

_____

_____

205a. How frequently does the tubewell you use become non-functional?

1	Every week	2	Every month
3	Every two months	4	Every 3-6 months
5	At least once a year	6	Rarely
7	Remains functional since its installation	(SKIP TO 206c)	

205b. During a breakdown of the tubewell, from where do you obtain water?

1	Neighbour's tubewell	2	Tubewell of another para
3	Shallow tubewell (Agriculture)	4	Deep tubewell (Agriculture)
5	Pond	6	River
7	Chara	8	Canal
9	Ringwell	10	Others_____ (Specify)

205c. How long is your tubewell left unrepaired after a breakdown?

Time _____

206a. For what reasons does the tubewell become usually non-functional?

1	Washer worn out	2	Missing handle or other parts
3	Broken nut bolt	4	Choked up condition
5	Other mechanical breakdown	6	Fall in water level
7	Quarrel over use right	8	Other social reasons_____ (Specify)
9	Other reasons_____ (Specify)	10	Don't know

206b. When did it last breakdown?

_____ days _____ months ago.

206c. What are the primary reason of your using tubewell water? (PROBE)

¦ 1 ¦	Prevents stomach disorder	¦ 2 ¦	Prevents diarrhoea/ cholera
¦ 3 ¦	Prevents dysentry	¦ 4 ¦	Prevents skin disease
¦ 5 ¦	Prevents other disease_____ (Specify)	¦ 6 ¦	Pure water
¦ 7 ¦	Don't have any pond	¦ 8 ¦	Others_____ (Specify)

207. What is the distance you are required to walk to reach to the tubewell in:

a. Dry season? _____ (local unit of distance)

b. Wet season? _____ (local unit of distance)

208a. Can you use drinking water from the tubewell in wet season?

¦ 1 ¦	Yes	¦ 2 ¦	No

(SKIP TO 208c)

208b. From where do you then obtain drinking water during wet season?

Sources in wet season_____

_____

208c. How much time is needed to fetch water from the tubewell in:

a. Dry season? _____ minutes
b. Wet season? _____ minutes

208d. Usually, how many people go to obtain water from the tubewell, at the same time?

208e. How long do you usually have to stand in the queue for your turn to obtain the water?

---

209. Are you satisfied using water from the tubewell?

1	Satisfied	2	Not satisfied

(SKIP TO 211)

210. Why do you say that you are not satisfied? (PROBE)

1	Water discharge not enough	
2	Location is inconvenient in terms of distance	
3	Location is inconvenient in terms of privacy	(SKIP TO 212a)
4	Tubewell owner does not allow frequent collection	
5	Any other problems_____ (Specify)	

211. Why do you say that you are satisfied? (PROBE)

_____

_____

212a. From where do you get your water for domestic purposes such as for...?

212b. Do you usually bring home the water for ..... or do you use it for that purpose usually at (source)?

Domestic purposes	Sources			
	Wet season		Dry season	
	Source	At home or at source	Source	At home or at source
2. Cooking		XXXXXXXX		XXXXXXXXXX
3. Dishwashing				
4. Laundry				
5. Bathing				
6. Cleaning		XXXXXXXX		XXXXXXXXXX
7. Religious activities				
8. Sanitation				
9. Domestic animals/ birds		XXXXXXXX		XXXXXXXXXX
10. Others _____ (Specify)				

212c. Interviewer: Check the category below based on responses in 212a.

1	Use tubewell water for all ..... domestic purposes	(SKIP TO 215c)
2	Use tubewell water for some domestic purposes	
3	Does not use tubewell water for any domestic purposes	

213. Why do you not use tubewell water for (all) domestic purposes? (PROBE)

1	Location is inconvenient in terms of distance	2	Takes time to collect water from tubewell
3	Had to put on hard labour	4	Others tubewell

¦ 5 ¦	Tubewell owner objects frequent collection	¦ 6 ¦	Tubewell will be non-functional if use tubewell water for all purposes
¦ 7 ¦	Sometimes water level goes down	¦ 8 ¦	Have easy access to pond
¦ 9 ¦	Location is inconvenient in terms of privacy	¦ 10¦	Had to work hard for the family
¦ 11¦	Others _____ (Specify)		

214a. Why do you not obtain, at least, drinking water from the tubewell? (PROBE)

_____

_____

214b. (Interviewer: If 'too far' is mentioned, ask:) What is distance have been convenient for you? (PROBE)

_____

_____

215a. Do you expect that you may have access to tubewell water in the future?

¦ 1 ¦	Yes	¦ 2 ¦	No

215b. Why do you thinks so? (PROBE)

_____

_____

(SKIP TO 216a)

215c. How many times do people from your household go to fetch water from the tubewell for...?

Purposes	Times	215d. How many day's water do you store at a time for....?	215e. What container do you use in storing water for..?	215f. Do you keep a lid on the container always, sometime or never?
1. Drinking				
2. Cooking				
3. Dishwashing				
4. Laundry				
5. Bathing				
6. Cleaning				
7. Religious activities				
8. Sanitation				
9. Domestic animals/birds				
10. Others_____ (Specify)				

216a. Does your household possess any latrine?

1	Yes	2	No

(SKIP TO 220c)

216b. Do you have more than one latrine?

1	Yes	2	No

(SKIP TO 216d)

216c. Do you have separate latrines for men and women?

1	Yes	2	No

216d. Where is the latrine (for women) located?

1	Inside the inner house	2	Inside the outer house
3	In between inner and outer house	4	Neighbour's house
5	Outside the house	6	Others _____ (Specify)

216e. How far away is the latrine (for women) located from ...?

Places/water sources	Distance
Dwelling house	
Hand pump	
Pond	
Other water sources	

217. What is the type of latrine you have (for women)?

1	Water sealed/slab latrine	2	Septic tank latrine
3	Pit latrine	4	Open latrine
5	Hanging latrine	6	Others _____ (Specify)

218a. From where did you get the parts of the latrine (for women)? (PROBE)

1	DPHE	2	Open market
3	NGO_____ (Specify)	4	Others_____ (Specify)

218b. Now I would like to know how much money you had to spend to have the latrine (for women) ?

(a) Latrine parts _____ Tk.

(b) Transport charge _____ Tk.

(c) Enclosure _____ Tk.

(d) Labour charge for installation _____ Tk.

218c. Is there anything that you do not like with the latrine (for women)? (PROBE)

1	Nothing to dislike	2	Becomes dirty in wet season
3	Enclosure is not good	4	Stench
5	Stools visible	6	Pit of latrine fillup frequently
7	Uncomfortable to sit down	8	Falls rain over the head
9	Flies sit on the body	10	Unclean
11	Others _____ (Specify)		

218d. How many months ago did you build the latrine (for women)?

_____ months ago

219a. Are you aware of any other types of latrine that a household may have had? (If yes). Please tell me their names.

1	Water sealed/slab latrine	2	Septic tank latrine
3	Pit latrine	4	Hanging latrine
5	Others_____ (Specify)	6	Don't know

(SKIP TO 221a)

219b. In your opinion, which is the best type of latrine for households in this locality?

_____ Best type for the locality

219c. Why? (PROBE)

1	Stench could not spread out	2	Stools not visible
3	Stools could not spread out	4	Does not become sick
5	No problem in using latrine in wet season	6	Not visible from outside
7	Can keep neat and clean	8	Could use for long time
9	Comfortable to sit	10	Others_____ (Specify)

220a. Interviewer: Check 217 and 219b tick the appropriate box below.

1	Possess the best type	2	Other types

(SKIP TO 221a)

220b. Why you don't have _____latrine?
(reported best type)

1	Poor/no money	2	Don't have sufficient space to make it
3	Rented house	4	Others_____ (Specify)

220c. What are the reasons that you do not have a latrine?

1	Poor/no money	2	Don't have sufficient space to make it
3	Latrine exist before but now it damaged	4	Nobody use latrine
5	Others_____ (Specify)		

220d. For a latrine you need 5 ft. X 5ft. space. Do you have this space in your compound if you decide to build a latrine in the future?

1	Yes	2	No

220e. Whose responsibility is it to install a latrine at your household?

1	Self	2	Household head
3	Other specific member	4	All members
5	Government	6	UP member/chairman
9	Others_____ (Specify)		

220f. Why?

_____

_____

_____

220g. What do you understand by hygienic latrine?

¦ 1 ¦	Septic tank latrine	¦ 2 ¦	Water sealed/slab latrine
¦ 3 ¦	Pit latrine	¦ 4 ¦	Which does not break down
¦ 5 ¦	No bad small	¦ 6 ¦	Can keep neat and clean
¦ 7 ¦	Germs could not spread out	¦ 8 ¦	Others_____ (Specify)

220h. Do you think it is beneficial to have a hygienic latrine for defecation?

¦ 1 ¦	Yes	¦ 2 ¦	No

220i. Why do you think so? (PROBE)

_____

_____

Any thing else? _____

_____

220j. Check 217 and the tick the appropriate category.

¦ 1 ¦	Possesses hygienic latrine	¦ 2 ¦	Does not possess (hygienic) latrine

(SKIP TO 2201)

220k. Do you know any household besides your own, which has a hygienic latrine? (Tick the response in 2201)

2201. Do you know any household, which has a hygienic latrine?

¦ 1 ¦	Yes	¦ 2 ¦	No

(SKIP TO 221a)

220m. Who are they?

_____

_____

221a. Defecation and cleansing practices.

Category of members	Usual place of defecation		Method of cleansing (use code)
	Day	Night	
Children (1-5 years)			
Boys (6-15 years)			
Girls (6-15 years)			
Adult males			
Adult females			

Code-value of method of cleansing:

(1) Use water pot for cleansing
(2) Come to the source of water
(3) Others _____
(Specify)

221b. Do you yourself use latrine - always, some time, rarely or never?

1	Always	2	Sometime
(SKIP TO 222)		(SKIP TO 222)	
3	Rarely	4	Never
(SKIP TO 222)			

221c. Have you ever used a latrine in the past?

1	Yes	2	No
		(SKIP TO 222)	

221d. (Interviewer: Check 216a and if not having latrine now, SKIP TO 222). Why have you then abandoned the habit? (PROBE)

_____

_____

222. Please tell me the benefits of using latrines, which you are aware of.

1	Bad small could spreadout	2	Environment not polluted
3	Nobody could see from outside	4	Bacteria could not spread out
5	Does not become sick	6	Others_____ (Specify)

Hygiene

223a. Do members of your family usually wash hands with anything after cleansing?

Members	Does not wash	Soap/	Ash	Soil	Leaves	Others	Without anything	Don't know
Adult Members	1	2	3	4	5	6	7	8
Minor Boys	1	2	3	4	5	6	7	8
Minor Girls	1	2	3	4	5	6	7	8
Self	1	2	3	4	5	6	7	8

223b. After cleaning up the behind of a young child, how do you wash your hands?

1	Just water	2	Water and mud
3	Water and ash	4	Water and soap

224a. How do you yourself wash your hands before taking foods or offering foods to others (including children)?

1	Just water	2	Water and soap
3	Don't wash		

224b. Do members of your household wash hands before taking or handling foods?

Members	Always	Some time	Never
Minor			
Boys	1	2	3
Girls	1	2	3
Adult			
Males	1	2	3
Females	1	2	3

225. How is disposal of your household rubbish done?

1	Rubbish pit	2	Thrown outside
3	Others _____ (Specify)		

Section 3

Prevalence of diseases

301. Please tell me what a person need to do in order to keep himself/herself in good health? Anything else?

Activities	Mentioned	
a. Brush teeth	Yes.....1	No.....2
b. Clean hands with soap or ash after defecation	Yes.....1	No.....2
c. Take bath	Yes.....1	No.....2
d. Use soap	Yes.....1	No.....2
e. Have vaccination	Yes.....1	No.....2
f. Put on clean clothes	Yes.....1	No.....2
g. Undertake exercise	Yes.....1	No.....2
h. Participate in games	Yes.....1	No.....2
i. Take nutritious food	Yes.....1	No.....2
j. Properly clean and cover food items	Yes.....1	No.....2
k. Drink tubewell water	Yes.....1	No.....2
l. Take regular rest	Yes.....1	No.....2
m. Use latrine	Yes.....1	No.....2
n. Proper disposal of domestic garbage	Yes.....1	No.....2
o. Living in airy and sunny dwellings	Yes.....1	No.....2
p. Use tubewell water for all purposes	Yes.....1	No.....2
q. Avoid going barefoot to defecate	Yes.....1	No.....2
r. Dispose of children's stools in a latrine	Yes.....1	No.....2
s. Others (Specify)	Yes.....1	No.....2

302. Do you know of any diseases caused with drinking or using of impure water?

1	Don't know	2	Does not cause any disease
3	Polio	4	Diarrhoea
5	Malaria	6	Typhoid
7	Dysentery	8	Stomach disorder
9	Eye infection	10	Skin diseases
11	Jaundice/hepatitis	12	Others_____ (Specify)

303a. Do you know what causes diarrhoea?

1	Don't know	2	Contaminated water
3	Flies	4	Mosquitoes
5	Improper cleaning of hand after defecation	6	Improper cleaning of hand after cleaning a child who has defecated
7	Old and rotten food stuff	8	Dirty hand
9	Unclean fruit and vegetable	10	Improper cleaning of hand before eating and serving food
11	Children's stools	12	Hanging latrines
13	Under-nutrition	14	Bottle feeding
15	Introduction of complimentary feeding to an infant less than five mothers of age	16	Withdrawal of colostrum
17	Superstition _____ (Specify)	18	Others _____ (Specify)

303b. What causes worm infection?

1	Indiscriminate defecation	2	Walking bare footed
3	Eating banana	4	Taking sugar/ molasses
5	Improper hand washing practices	6	Others_____ (Specify)

304. How do you tell if a person has diarrhoea?

1	Cannot ascertain	2	Loose motions more than three times a day
3	Watery stool	4	Effortless defecation
5	Presence of mucus in stool	6	Presence of blood in stool
7	Passing stool and vomiting	8	Others _____ (Specify)

305a. Now, I would like to ask you some questions about sickness among your household members (including yourself).

Had anyone of your household member been sick in the last 24 hours? I mean, since yesterday at the same time as now?

1	Yes	2	No

(SKIP TO 306)

305b. Just to be sure, during the last 24 hours did anybody have had such diseases as diarrhoea?

1	Yes	2	No

(SKIP TO 307)

306. Please tell me who was sick? Anybody else?

Line No.	Name	What disease did he/she have?
	Female	
	Male	

307. Interviewer: check 103 and 104, and tick the appropriate box below?

1	Having living children	2	No living children

(SKIP TO 401)

308. Please tell me the names of your children aged less than 5 years (Please start from the youngest child). I would now like to ask you some specific questions about them?

	Name of youngest child (name) 1	Name of child next to youngest (name) 2	Name of child second from youngest (name) 3	Name of child third from youngest (name) 4
309a.How old was (name) at his/ her last birth day?	__ __ AGE IN COMPLETED MONTHS	__ __ AGE IN COMPLETED MONTHS	__ __ AGE IN COMPLETED MONTHS	__ __ AGE IN COMPLETED MONTHS
309b.Is (name) a boy or girl?	Boy 1 Girl 2	Boy 1 Girl 2	Boy 1 Girl 2	Boy 1 Girl 2
309c.Is he/she living with you?	Yes 1 No 2 NEXT CHILD	Yes 1 No 2 NEXT CHILD	Yes 1 No 2 NEXT CHILD	Yes 1 No 2 GO TO 401
309d.Since__(in the last 14 days), was there one day or more when (name) had diarrhoea? That is, he/she was having thinner and more frequent stools than usual?	Yes 1 No 2 NEXT CHILD	Yes 1 No 2 NEXT CHILD	Yes 1 No 2 NEXT CHILD	Yes 1 No 2 GO TO 401
309e.Did name have 'loose motion' in the last 24 hours? I mean since yesterday at the same time as now_____?	Yes 1 No 2	Yes 1 No 2	Yes 1 No 2	Yes 1 No 2

Section 4

Sources of Health Related Information

401. If any one among your friends and relatives wanted to know about oral rehydration therapy, tetanus injection, immunization for children, or any other health-related information, where would he/she go to get it?

1	Upazila health complex/hospitals	2	Union health and family welfare centre
3	Unqualified practitioners	4	Health/family planning workers
5	Neighbours	6	School teacher
7	Students (school going boys/girls)	8	Friends/Relatives
9	Imam	10	Poster, Handbill, Flip chart
11	Union chairman	12	Union member/ward commissioner
13	NGO worker	14	Relatives
15	Qualified doctor	16	Others _____ (Specify)

402. During the last three months, did you ever talk to any body about health problems of children or of any other persons (including yourself in your household). Or did any body ever talk to you about any health problems or seek any health information from you?

1	Yes	2	No (SKIP TO 405a)

403. Who did you talk to? (PROBE)

Talked to:	Tick the category if mentioned
Husband	
Mother	
Father	
Mother-in-law	
Father-in-law	
Other relatives	
Friends	
Next door neighbors	
Qualified doctors	
Hospital/clinic workers	
Health and family planning field workers	
Village doctors	
NGO workers	
Others _____ (Specify)	

404. What did you talk about? (PROBE)

_____

_____

Any thing else? _____

_____

405a. During the last three months, did you learn anything from any one about the importance of Tubewell water, hygienic latrine and hand washing?

1 Yes	2 No (SKIP TO 406)

405b. Whom did you learn from?

(INTERVIEWER: Circle Code 1 for each source mentioned spontaneously. Then, proceed down the column, reading the name of each source not mentioned; for each source mentioned after prompting, circle code 2, otherwise circle code 3.).

Sources	Spontaneously mentioned	Mentioned after prompting	
		Yes	No
Health and family planning workers	1	2	3
DPHE workers	1	2	3
School teachers	1	2	3
School going boys/girls	1	2	3
Neighbours	1	2	3
Relatives	1	2	3
Doctors	1	2	3
Others _____ (Specify)	1	2	3

405c. You have said that you learnt about tubewell water, hygienic latrine and handwashing from (cite all the sources mentioned either spontaneously or after prompting). Now, tell me what did you learn? (PROBE)

Anything else ?

406a. During the last three months, did you visit any health centres or any other places for any health problems for your self or for any other persons in your household?

1	Yes	2	No

(SKIP TO 409)

406b. Who went there? Yourself or some one else?

1	Self	2	Some one else

407. Where did you go?

1	Local doctors	2	Health/family planning workers
3	Upazila health complex/hospitals	4	Union health and family welfare centre (UHFWC)
5	Kabiraj	6	Fakir
7	Others _____ (Specify)		

408. Why did you go? (PROBE)

_____

_____

Any thing else? _____

_____

409. In the last one month have you heard or seen or read any message, story or advertisement about immunization for children, tetanus shots for pregnant mothers or Oral Rehydration Therapy?

1	Yes	2	No (SKIP TO 501)

410. Where did you hear or see or read?

1	Radio	2	Television
3	Cinema	4	Newspaper/Magazine/ Periodical
5	Poster/Signboard/ Billboard	6	Folk poems
7	Folk drama (Gram Theatre)	8	Miking
9	OTHERS _____ (Specify)		

411. What did the message(s) say about?

_____

_____

Any thing else? _____

_____

412a. If the messages are to given for you on tubewell water, hygienic latrine and hand washing, what would be the most credible source?

1	Radio	2	Television
3	Household visit	4	Cinema
5	Poster/Signboard/ Leaflet	6	Newspaper/Magazine
7	Others _____ (Specify)		

412b. Why do you think so?

_____

_____

413. In your locality, there are many households that do not have hygienic latrine, how can they be motivated to have hygienic latrine for defecation? (PROBE)

_____

_____

Any thing else? _____

_____

414a. Is there anything mentioned about defecation practice in your religion?

1	Yes	2	No
			(SKIP TO 415a)
3	Don't know		
	(SKIP TO 415a)		

414b. What did it say?

_____

_____

Any thing else? _____

_____

415a. Is there anything mentioned about hygiene in your religion?

| 1 | Yes

| 2 | No

(SKIP TO 416a)

| 3 | Don't know

(SKIP TO 416a)

415b. What did it say?

_____

_____

416a. Is there anything mentioned about hand washing in your religion?

| 1 | Yes

| 2 | No

(SKIP TO 501a)

| 3 | Don't know

(SKIP TO 501a)

416b. What did it say?

_____

_____

Section 5

Household characteristics

501a. Interviewer: Check sample identification of household part of schedule and tick the appropriate box below.

¦ 1 ¦	H/H head	¦ 2 ¦	Not H/H head

(SKIP TO 506a)

501b. Who is the head of your household?

_____ Name

502. What is his/her principal occupation?

_____ Principal occupation

503. Did he/she ever attend school?

¦ 1 ¦	Yes	¦ 2 ¦	No

(SKIP TO 506a)

504. Was it a Primary school, Madrasa, Secondary school or higher that he/she attended last?

¦ 1 ¦	Primary school	¦ 2 ¦	High school
¦ 3 ¦	College/ University	¦ 4 ¦	Madrasa
¦ 5 ¦	Other _____ (specify)	¦ 6 ¦	Don't know

505. What was the highest class he/she passed?

_____ Class

506a. Do you have any agricultural land which is owned and worked by your household members?

1	Yes	2	No (SKIP TO 507)

506b. How much? _____ decimals

507. Does your household (or any member of your household) have the following items?

1	Almirah	2	Two-in-one
3	Cot	4	Television
5	Table/chair/bench	6	Sewing machine
7	Watch/clock	8	Motor cycle
9	Bi-Cycle	10	Radio

508. Interviewer: Circle the appropriate code, according to the construction materials of the main dwelling structure under the given categories.

Categories	Concrete	Tin	Thatch	Other (specify)
Roof	3	2	1	7
Wall	3	2	1	7
Floor	3	XXXXXXXXXXX	XXXXXXXX	7

509. Does your household have the following animals? If yes, how many?

☐	Cattle	_____
☐	Buffalo	_____
☐	Goat	_____
☐	Chicken	_____
☐	Duck	_____
☐	Pigeon	_____
☐	Others	_____ (specify)

510. TERMINATE THE INTERVIEW. WHEN YOU TERMINATE THE INTERVIEW (AND BEFORE YOU LEAVE THE RESPONDENT):

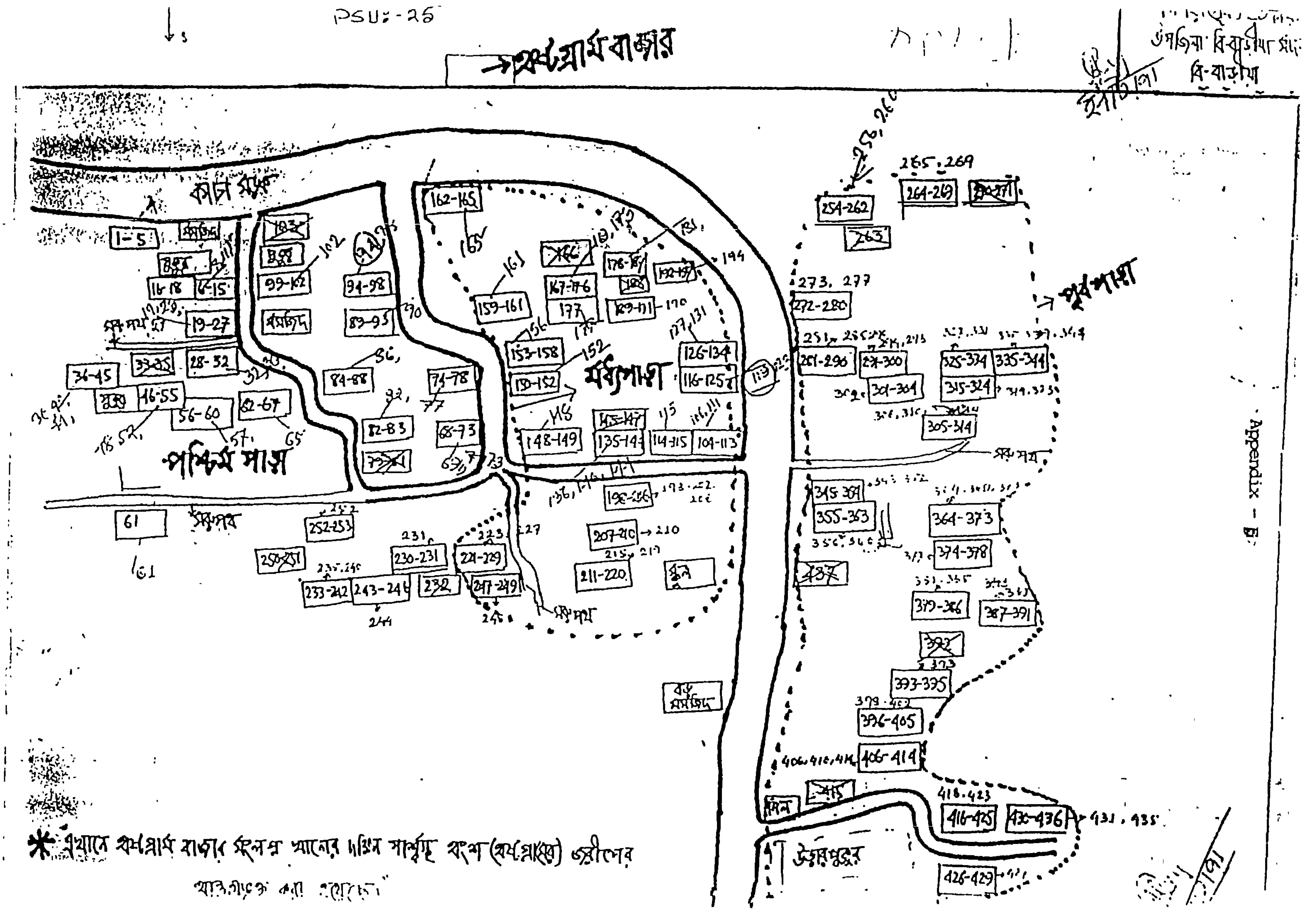
CHECK BACK OVER THE SCHEDULE AND MAKE SURE THERE IS AN ANSWER TO ALL APPLICABLE QUESTIONS, SKIP INSTRUCTIONS ARE CORRECTLY FOLLOWED AND THAT THE RESPONSES ARE ENTERED ELEGIBLY AND IN THE CORRECT FORM.

THANK THE RESPONDENT FOR HER TIME AND COOPERATION

TIME ENDED _____

INTERVIEWER'S COMMENTS:

SUPERVISOR'S COMMENTS:


PSU:-25
কাঁচা রাস্তা
পশ্চিম পাড়া
মধ্যপাড়া
পূর্বপাড়া
মসজিদ
স্কুল
বড় মসজিদ
উত্তরপুকুর
1-5
16-18
19-27
28-32
36-45
46-55
56-60
61
62-67
68-73
74-78
82-83
84-88
89-93
94-98
99-102
104-113
116-125
126-134
135-144
148-149
150-152
153-158
159-161
162-165
167-176
177
178-187
192-197
198-206
207-210
211-220
224-229
230-231
233-242
243-244
247-249
252-253
254-262
264-269
272-280
281-290
293-300
301-304
305-314
315-324
325-334
335-344
345-354
355-363
364-373
374-378
379-386
387-391
393-395
396-405
406-414
416-425
426-429
430-436
Appendix - B

Attachment - 1

THE NATIONAL SURVEY ON STATUS OF RURAL WATER SUPPLY AND SANITATION

Tubewell Sample Forms (TSF)

MITRA AND ASSOCIATES
2/17, Iqbal Road
Mohammadpur, Dhaka

TSF - 1

Village:_____ Upazila :_____

Union :_____ District:_____

Conditions of tubewell

Tubewell Sl. No.	Location and address	Type of tubewell (pump/ shallow/ deep)	Present conditions				Identifications of respondent
			Running	Chokedup		Temporarily out of order	
				Partially	Completely		

TSF - 2

Installation and Maintenance

Tube-well Sl. No.	Ownership of tube-well (Govt./ private)	Contribution to installation (Amounts)	Maintenance					Costs of maintenance in the last 3 months
			Id. of caretaker	Extent of caretaker's training (No training/Not adequate/ adequate	Availability of wrenches/kits	Quality of maintenance (good/ moderate/bad)	Frequency of maintenance	

TSF - 3

Conditions of Platforms and Chemical Quality of Water

Tubewell Sl. No.	Conditions			Chemical quality	
	Platform (good, cracked, tilted damaged, not exists)	Drainage system (good, moderate, bad)	Discharge of water (gallons per minute)	Iron concentration of water (PPM)	Chloride concentration of water (mgs per liter)

Attachment - 2

MITRA AND ASSOCIATES

THE NATIONAL SURVEY ON STATUS OF RURAL
WATER SUPPLY AND SANITATION

HOUSEHOLD LISTING SCHEDULE

NAME OF ZILA_____ NAME OF UPAZILA/THANA_____

NAME OF UNION/WARD_____ NAME OF VILLAGE/
MOHALLA _____

NAME OF PARA _____

PSU NUMBER_____ STRATUM NUMBER _____

H.Hs Sl. No.	Map No.	Name of the household head	Occupation	Father's/Husband's name	Land marks of H/Hs & name of bari	Number of usual HH members