


822 BD93



# The Status of Rural Water Supply and Sanitation

822-BD93-13662



Photographs by Shehzad Noorani  
Design: Nazmul Ameen

LIBRARY  
INTERNATIONAL REFERENCE CENTRE  
FOR COMMUNITY WATER SUPPLY AND  
SANITATION (IRC)

# The Status of Rural Water Supply and Sanitation

---

LIBRARY, INTERNATIONAL REFERENCE  
CENTRE FOR COMMUNITY WATER SUPPLY  
AND SANITATION (IRC)

P.O. Box 53190, 2509 AD The Hague  
Tel. (070) 814911 ext. 141/142

BARCODE 13662

022 B093

Produced by UNICEF  
in collaboration with the DPHE  
August, 1993

---

The rural water supply  
and sanitation programme  
in Bangladesh is run by the government  
Department of Public Health and Engineering (DPHE).





---

# The Status of Rural Water Supply and Sanitation in Bangladesh

To keep healthy, people must be able to keep themselves clean; and to do this they need a good supply of safe water for drinking as well as for personal hygiene, and a sanitary way to dispose of faeces.

## Safe Water

In the last decade, there has been a dramatic improvement in the supply of safe water. As of 1991, 85% of rural Bangladeshi households have access to safe drinking water within 150 metres, thus improving the quality of life. But only, 16% of rural households use clean water for all household purposes - washing as well as drinking. In urban slums just over half of the households use tubewell water for all their needs.

## Sanitation and Hygiene

The number of latrines has also increased in recent years. A third of rural households now have a sanitary latrine, and in the urban slums almost half have hygienic latrines. But even in households where there is a latrine, children rarely use it. Fewer than one in ten children use a latrine.



---

# Goals for the 1990s

The Government of Bangladesh's goals for sanitation and water supply for the 1990s are:

- Universal access to safe water by 1995
- Access to proper excreta disposal by 35% of the population by 1995
- Universal access to proper excreta disposal by 2000

The recent success of the water programme and the thrust given to the sanitation sector suggests that these goals can be met.

## Data Base

Most of the information in this booklet is based on the 1991 National Survey on Status of Rural Water Supply and Sanitation for DPHE/UNICEF.

The data on rural areas is accurate to within plus or minus 3.5%; however, the small sample size in the urban slums and fringes makes the margin of error for the urban slum data much greater and these figures should be viewed with caution.

The data related to the sanitation coverage for 1993 were collected through a survey, using a Rapid Assessment Technique, carried out in mid 1993.

All the graphs in this booklet are based on rural data.

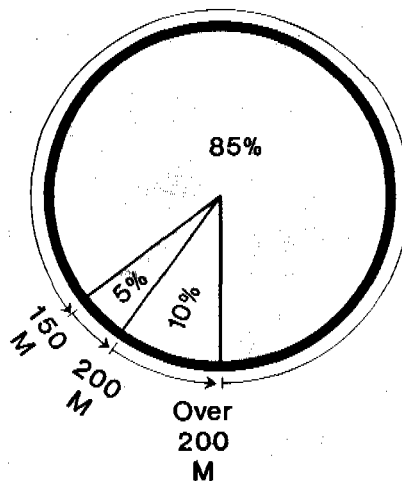
# Water Supply

## Access to Water

Access to tubewell water is now very high in Bangladesh. In rural areas, over 95% drink tubewell water. About 85% of households are within 150 metres of a source of clean water; in urban slums 98% of households are within 150 metres of safe water. But in hilly areas and the coastal belt over 20% of people have to go more than 200 metres to get clean water.

Time is just as important a factor as distance. In rural areas the average time required to fetch water was 15 minutes during the dry season but over 20 minutes

The distance travelled to fetch tubewell water in rural areas



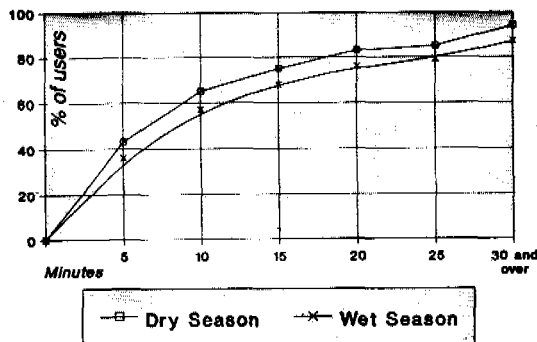
during the wet season. In urban slums it took on average 7 minutes to get water, with little change between the seasons.

These figures, of course, only show the time taken to make one trip for water, but most households make at least two trips to fetch water each day.

In the coastal belt and hilly regions people needed much more time to get water, and in the rainy season in the coastal belt the average time was almost 40 minutes for one trip.

Those with access to private pumps, of course, usually spent less time getting water than those using public pumps. And richer families usually had better access to clean water than poorer families.

Time needed for one trip to get water in rural areas







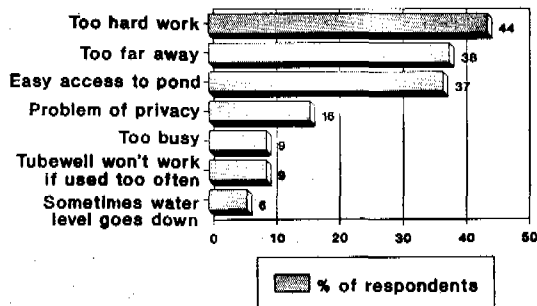
*A pond for all purposes is a source of disease transmission*

## The Use of Safe Water

Only 16% of rural households used tubewell water for all household needs, washing as well as drinking. Despite the fact that most households are now within a reasonable distance of a tubewell, many people still use unsafe pond water for household purposes.

People gave many reasons for not using tubewell water for all their household needs. The main reasons were that it took too much hard labour and too much time to get water. Easier access to pond water was the reason given by about a third of the respondents. About 15% said that there was a problem of privacy at the tubewell site.

### Reasons for not using hand pump water for all domestic purposes



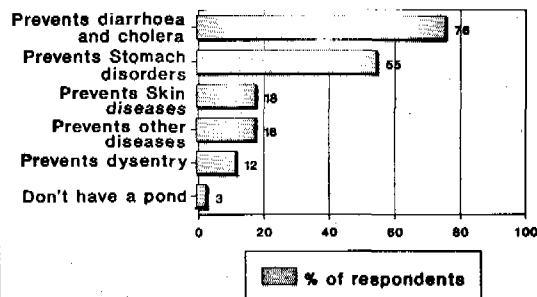
These answers were supported by the fact that people who were within 50 metres of a pump were more likely to get all their water from that pump.

Families should be motivated to increase their use of tubewell water since the present discharge of water from tubewells is sufficient to meet all the domestic needs of the population, and the distance to tubewells is reasonable, especially when compared with other developing countries.

### Awareness of Benefits of Safe Water

Three quarters of the respondents were aware that tubewell water could help to prevent diarrhoea/cholera. But few people were aware that other diseases could be prevented by using safe water.

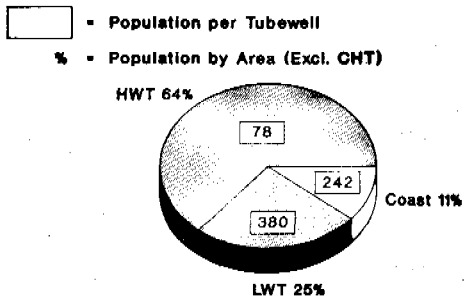
### Perceptions of benefits of drinking tubewell water



# Public Tubewell Coverage

Public tubewell coverage is generally good, but there are pockets where people do not have good access to tubewell water, especially in hilly regions, the low water table area and in the coastal belt. On average there is a public tubewell for

## Area-wise coverage & population per operating public tubewell (rural) 1992

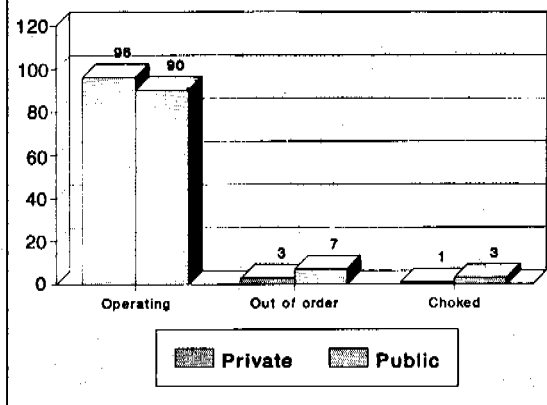


Average Population served per Operating Tubewell = 92  
 (\* Increased to 123 if suction tubewells affected by ground water decline considered.)



*The No. 6 handpump can be maintained by the community.*

### Operating condition of tubewells



every 92 people, in the country as a whole, but there is a great regional disparity. In fact 78 people are served by each public tubewell in high water table areas, while on the coast each public tubewell serves 242 people and in the low water table areas 380 are served by each public tubewell.

### The Condition of Tubewells

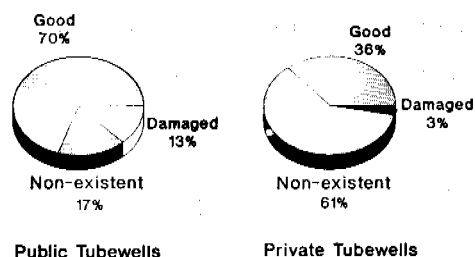
The condition of tubewells is also generally good. Over 90% of the public tubewells were operating at the time of the survey compared to 94% of private tubewells. In the urban slums and fringes, 85% of public tubewells compared with 98% of private tubewells were in operating condition.

### The Condition of Platforms

The platform around the hand pump not only makes it easier to use the hand pump but also prevents the formation of stagnant pools and protects the tubewell water from contamination.

There is a big contrast between the condition of platforms around public and private hand pumps. Most public rural hand pumps had platforms in good condition. But most private rural hand pumps had no platform at all, and only 30% had a platform in good condition.

### The condition of tubewell platforms



## The Declining Water Table

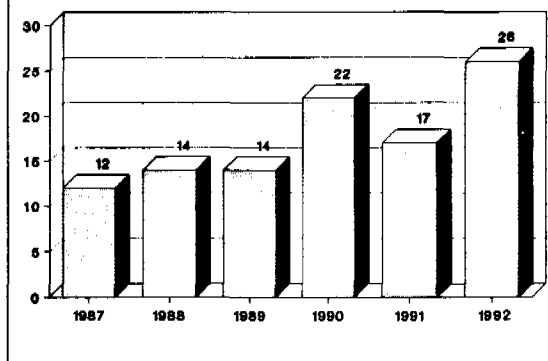
In recent years the water table has been declining in Bangladesh because of increased agricultural irrigation. In 1986 only 12% of unions had groundwater below the suction level (8 metres). In 1991 26% of Unions had groundwater below the suction level.

DPHE/UNICEF have initiated a study to predict the future groundwater fluctuations. Some early predictions indicated that by the year 2000 as much as 50% of the traditionally high water table areas may have water levels below the suction limit for at least part of the year.

## The Problem of the Declining Water Table

The conventional No.6 suction pump can not pump up water from below 25 feet (approx. 8 metres). As the water table declines, more and more No.6 pumps will cease to provide water, especially during the dry season - April to June - when the water table is at its lowest. Even if we assume that only 20% of tubewells are affected this still means that about 150,000 public tubewells will cease to function at the peak of the dry season.

Percentage of unions with ground water below 25 feet



## The Solution — The Tara Pump

In the 1980s the Tara pump was developed to lift water at depths of up to 12 metres. 50,000 Tara pumps have already been installed in low water areas, and 90% of them were found to be in working order during this survey.

When new pumps need to be installed in low water areas, the Tara pump is the best choice. But the cost of the Tara pump is about three times higher than that of the No.6 tubewell, and if 50% of the currently high water table areas were to fall below the suction level, as has been predicted, the cost of replacing the existing pumps with Tara pumps would be enormous.

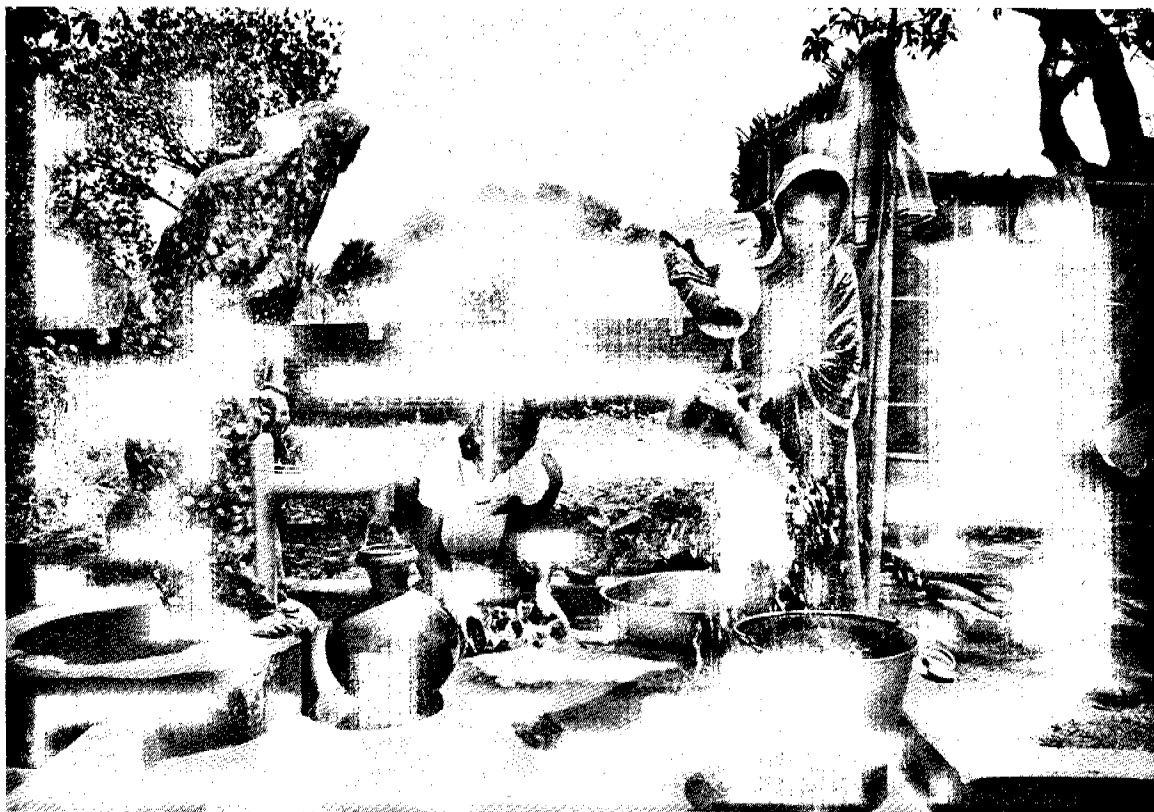
---

## Low Cost Solutions

Since early 1991 DPHE and UNICEF have been working together to develop a low cost method to rehabilitate the existing No.6 tubewells that have been affected by the drop in the water table. One possible option being explored is the mini Tara. This is a modified Tara pump which fits into the existing No.6 tubewell, eliminating the need to redrill the well.

Another option is to modify the existing No.6 hand pump by lowering the piston assembly so that it can draw water as deep as 11 metres.

Field and laboratory tests of both these options, in late 1991 and 1992, have shown encouraging results, but the pumps will undergo further testing before they can be considered for wider application.

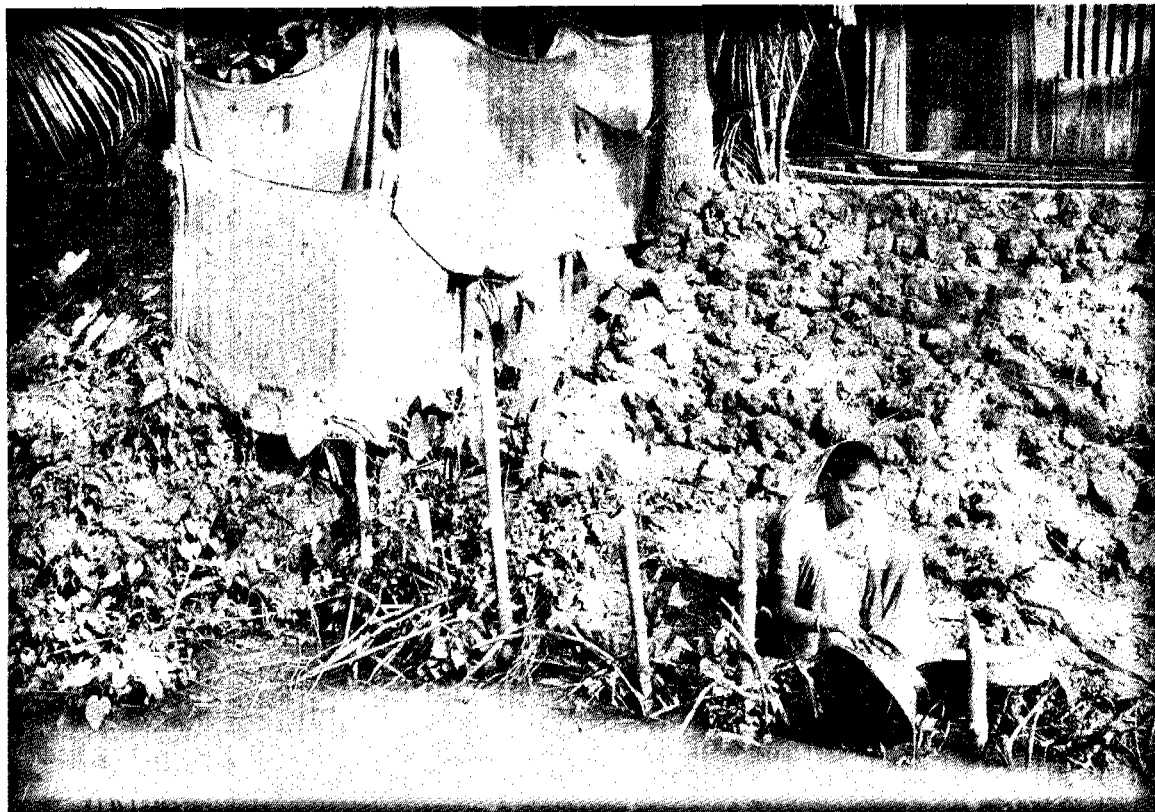


*Safe water and good hygienic practices are basic ingredients to health.*

---

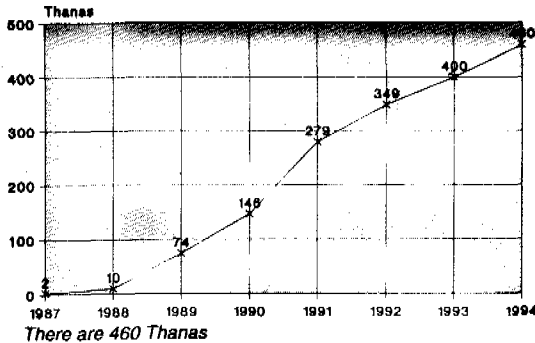
# Sanitation

The great improvement in the supply of clean water in Bangladesh has not brought about the fall in diarrhoea rates that was hoped for. 260,000 children still die every year from diarrhoea. Safe water alone is clearly not enough to prevent the spread of diarrhoeal diseases.

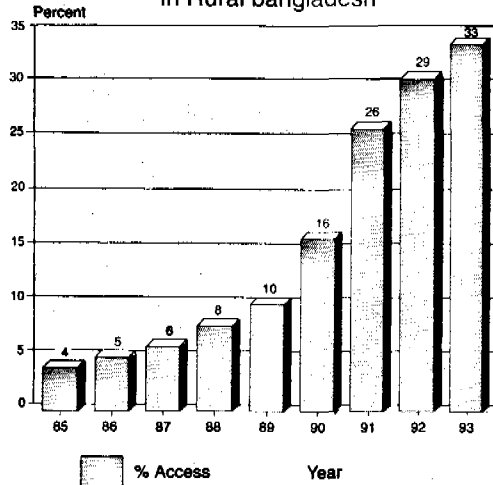


*The hanging latrine... a health threat to the community and the environment.*

### Number of Thanas adopting the Integrated Approach



### Access to Sanitary Latrines in Rural Bangladesh



An Integrated Approach to water and sanitation is needed. This combines safe water with sanitary latrines and good personal hygiene, especially hand washing. By 1995 it is hoped that all 460 Thanas will have adopted the Integrated Approach.

## Latrines

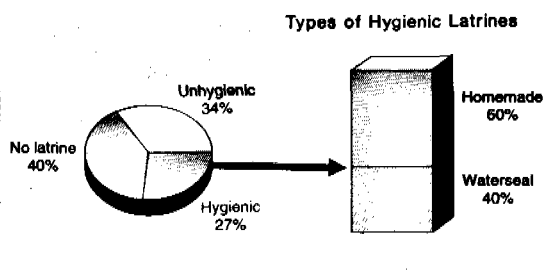
In Bangladesh, people are generally latrine conscious. As far back as 1985 it was estimated that 43% of rural families had a latrine. Most latrines, however, were built only for privacy and were unhygienic, creating environmental pollution, especially of surface water. In recent years, the use of sanitary latrines has increased.



*The do-it-yourself (homemade) sanitary latrine is both socially acceptable and affordable.*



## Types of latrines used in rural areas



The survey found that 26% of rural households and 48% of households in urban slums and fringes now have hygienic latrines. Many of these latrines were built recently; over a third of the rural latrines had been built in the previous year and over 80% were less than five years old. The rural coverage has reached 33% in mid 1993 as revealed by a Rapid Assessment Survey.

This is an encouraging trend, but many more hygienic latrines must be built in order to cut down the transmission of disease.

## Poverty is Not a Constraint

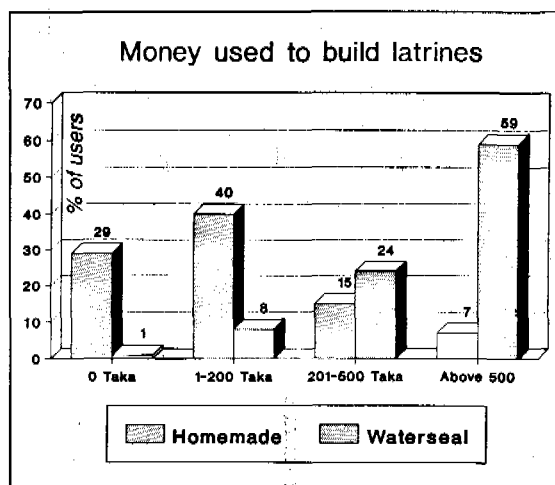
As might be expected, higher income and better educated people are more likely to have a latrine. There were latrines in 74% of households where the head of household had completed primary education, and in 83% of households

where the head of household was educated to secondary level or above.

But poverty need not be a constraint. There are now a number of low cost options for building latrines.

## Affordable Technology

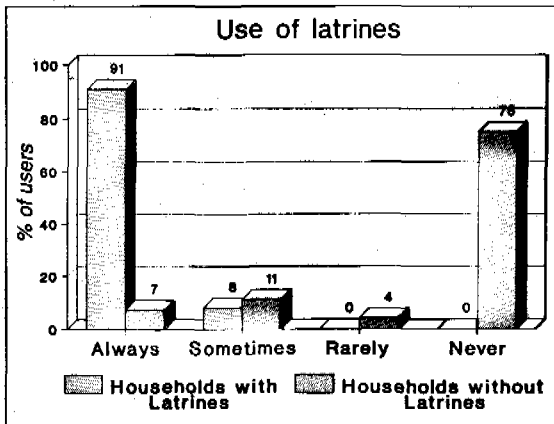
Homemade pit latrines can often be made from materials available around the household and often without spending any cash. This traditional technology brings sanitary latrines within reach of



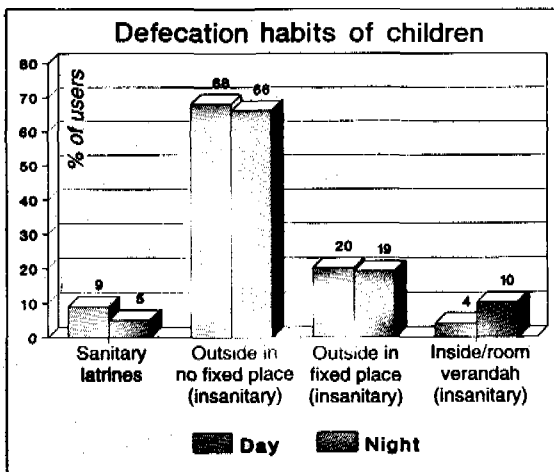
even the poorest families. Also one ring one slab waterseal latrines are now widely available for a few hundred taka, and are suitable in areas where the soil is stable and pit linings are not necessary.

# The Use of Latrines

Once people have built latrines, they must learn to use them. Although most adults who own latrines use them, they may not use them all the time. Women are more likely to use latrines than men, and girls use latrines more often than boys. Latrines within the inner compound of the bari are more likely to be used, especially by women and girls.



*Proper handwashing after latrine usage.*

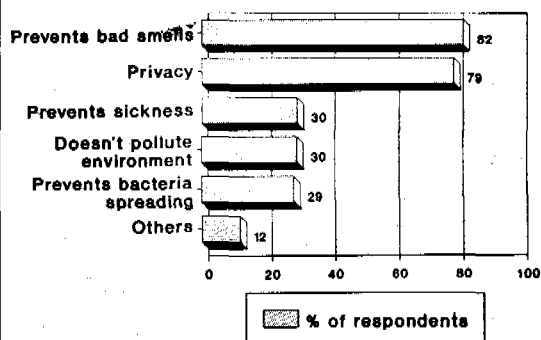


The major problem, however, is that small children are unlikely to use latrines. Most children under the age of five have no fixed place of defecation.

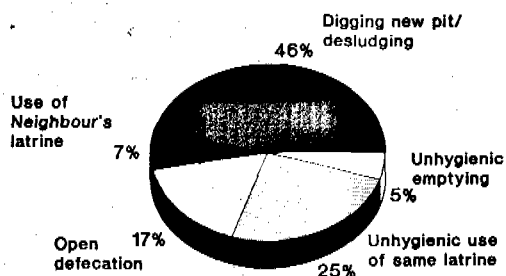
## Fewer than 10% of Children Use Latrines

Children between one and five years old are the least likely to use latrines or any fixed place of defecation.

### Perceived benefits of latrine use



### Action taken after latrine pit fills up



Source : WHO-DPHE-UNICEF study of one-slab and one-ring waterseal latrine (March 1992)

## Perceived Benefits of Latrines

People perceive two main benefits of latrines. About 80% of respondents said that latrines reduced smell and a similar number said that latrines provided better privacy. Only about a third thought that latrines prevented pollution of the environment, and prevented the spread of bacteria and disease.

## The Maintenance of Latrines

A DPHE/WHO/UNICEF survey in March 1992 followed up a small sample of recently built one slab one ring latrines that had become filled up. Just over half the households either built a new pit or dealt with the sludge in a sanitary way. 17% of the people returned to open

defecation and 25% modified their latrines so that the overflow went into a nearby ditch or pond in an unsanitary way. This suggests that many people did not understand the health reasons for building the sanitary latrine; and did not understand the need to dig a new pit.

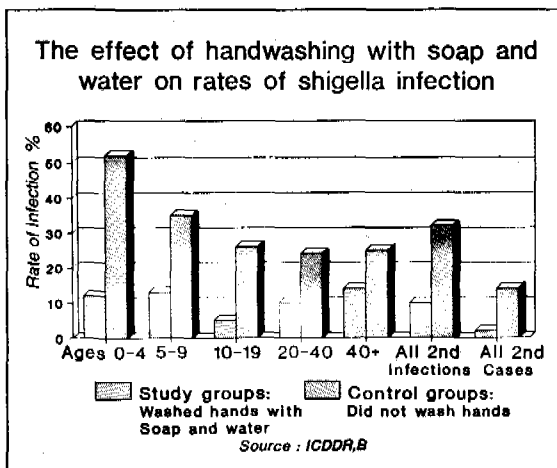
## The Distance of Latrines from Water Sources

If latrines are placed too close to tubewells, it is possible that the tubewell water may become contaminated. The guideline is to build latrines no closer than 10 metres from tubewells. 18% of rural latrines, and almost half of those in urban slums, were within 10 metres of hand pumps.



# Personal Hygiene

Hand washing may be one of the most important personal hygiene habits for the prevention of diarrhoeal disease. A study conducted by ICDDR,B showed that even in slum environments hand washing with soap cut down on the transmission of shigella, a life-threatening diarrhoea.



## Hand Washing

Over 90% of respondents said that they washed hands after defecation, after cleaning the back of a child and before preparing food. But relatively few used soap or ash. This behaviour was reported by the respondents, and was not observed by the interviewers.

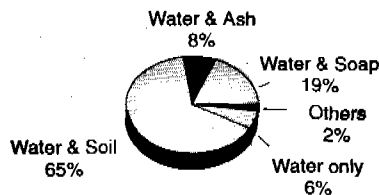
When asked about practices that were important to keep in good health, only 12% of rural and 21% of urban slum dwellers said that hand washing with soap or ash was necessary to maintain good health.

## Rural handwashing practices

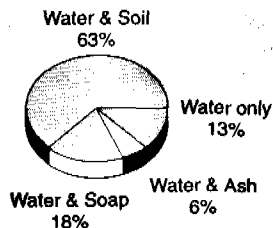
### 1. Before handling food



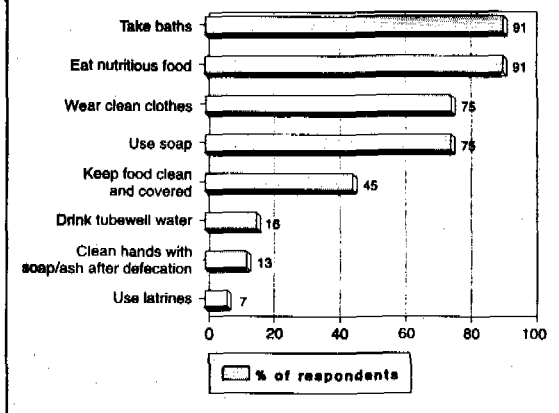
### 2. After defecation



### 3. After cleaning up child's bottom



### Perceptions of habits necessary for good health



### Perception of Good Health Practices

About 90% of respondents identified bathing and eating nutritious foods as necessary for good health, and over 75% believed that using soap and wearing clean clothes were important. The form in which a question is asked, of course, affects the kind of answer. But it seems that although overall personal cleanliness is seen as very important, proper hand washing is not seen as very important.

Understanding of the importance of drinking safe water and of using sanitary latrines was also very low. Only 16% of rural and 30% of slum dwellers thought drinking tubewell water was important for health, and only 7% of rural and 11% of slum dwellers thought that using a latrine was important for health.

The reason for such a low priority being given to safe drinking water, good hand washing, and use of latrines, may be because of a poor understanding of the faecal transmission of diseases and worms.

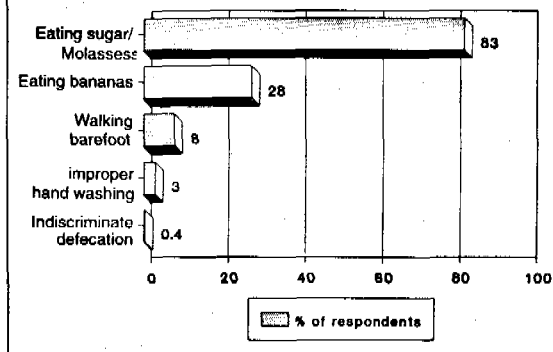
### Understanding of Disease Transmission

Although about 90% of respondents were aware that diarrhoea could be contacted by drinking contaminated water, very few realised that other diseases could be transmitted through water.

### Beliefs about Worm Infestation

Almost no respondents were aware that indiscriminate defecation or poor hand washing was a cause of worm infestation. The majority believed that eating sugar and eating bananas were the most likely cause of worms.

### Perceptions about causes of worm infestation



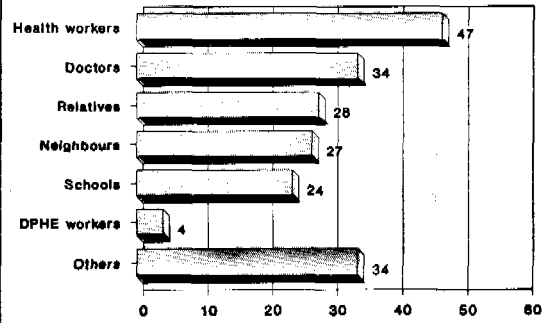
## Access to Information

7% of rural people and about 10% of urban slum dwellers had learnt about the health benefits of tubewell water, hygienic latrines and hand washing in the three months preceding the national survey. For these people the most important source of information had been house visits by health and family planning workers, with doctors and school teachers/students being the next most important sources.



*Participatory approach to information transfer and sharing.*

### Sources of information about water, sanitation & hygiene



## Mass Media

A surprising number of respondents were aware of public health messages about immunization and ORS on TV and radio - 14% of rural people and 28% in urban slums and fringes. Up to the time of the survey there had been no mass media campaign for public hygiene.

## Religious Texts

About 50% of rural people (slightly fewer in urban slums and fringes) were aware of instructions about defecation and hand washing in religious texts.

---

## The Survey

Most of the data used in this booklet is from the "1991 National Survey on Status of Rural Water Supply and Sanitation for DPHE/UNICEF" conducted by Mitra & Associates.

The information was gathered between December 11, 1991 and January 29, 1992.

### Margin of Error

The figures for rural areas have a margin of error of plus or minus 3.5%, but because of a smaller sample size the figures for the urban slums and fringes have a margin of error of plus or minus 16%.

### The Survey Method

The survey divided the country into seven strata or areas -shallow tubewell, low water table, shallow tubewell/low water, coastal belt, hilly regions, stony regions , and urban slums and fringes.

The survey team randomly selected 45 clusters of households from the seven strata. (See map.)

Each cluster consisted of 450 - 550 households. In rural areas this was as

close as possible to one village, but in urban slum areas a cluster was formed with artificially defined borders.

In each cluster the interviewers, who were all female, counted the hand pumps and checked the condition of the pump and platform, as well as the iron and chloride concentration of the water. They also recorded the number of people in each household in the cluster.

A more detailed household questionnaire was used in 100 households randomly selected within each cluster. An adult woman was interviewed in each household; she was asked questions about use of water and latrines, personal hygiene practices, and knowledge of health matters, especially those related to water and sanitation.

### Other Sources of Data

1. Moslem Uddin Khan, (ICDDR,B), "Interruption of shigellosis by hand washing", Transactions of the Royal Society of Tropical Medicine and Hygiene, Vol. 76, No. 2 1982.
2. WHO/DPHE/UNICEF, "User's attitudes after the one slab-one ring latrine pit is filled", WHO project BAN/CWS/001, March 1992.
3. Muhammad Shuaib, Study on Child Survival and Development Indicators: A Sub-national Data Base, Dhaka University (under finalisation).