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TOWARDS CLEAN LIVING AND A HEALTHY ENVIRONMENT IN BANGLADESH



An advocacy for a New Direction in
Water and Sanitation Sector



UNICEF
BANGLADESH

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*First part very
factual & enlightening
later too little attention
to what others did in
sector.*

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AND A HEALTHY ENVIRONMENT
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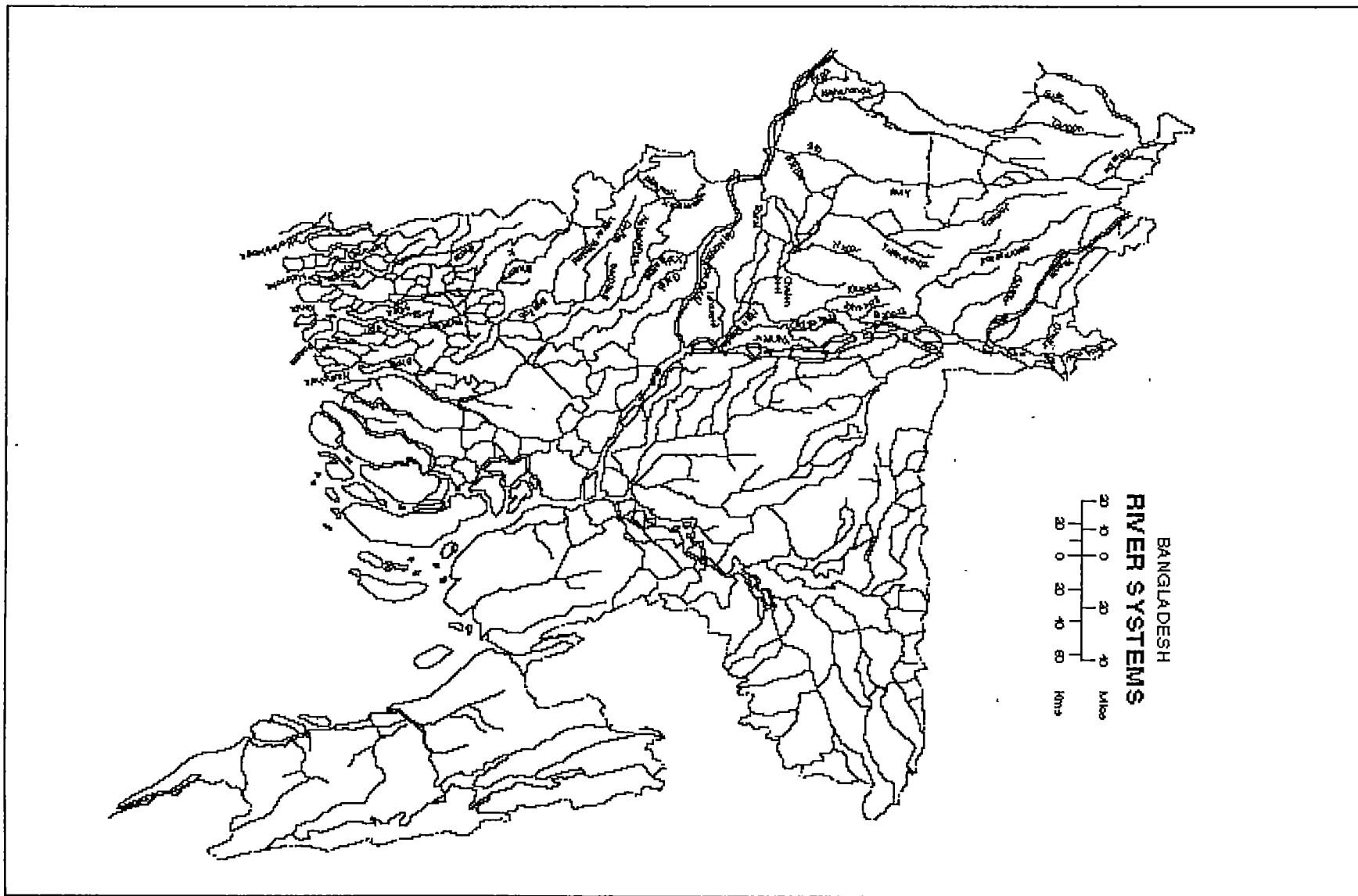
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Key country data:

Population: 118 million (est. 1996)
Annual population growth rate: 2.2% (1991)
Population density: 718 per sq. kilometre
Rural/urban ratio: 83/17 (1993)
GNP per capita: US\$220 (1993)







Introduction: water gardens of Bengal

Bangladesh is a country moulded by water. Great rivers and floodplains dominate the landscape, endowing it with an extraordinary fertility. Every contour of the countryside is threaded with streams and ponds, bringing water to the threshold of almost every home.

But this source of life is also a threat to life. With 8,000 people per 1,000 hectares, the Bangladesh countryside is the most densely-populated on earth. Nature's drainage system is overwhelmed and surface water dangerously polluted with human wastes. In some areas the water below ground is chemically contaminated too. The incidence of water- and dirt-related sickness is high. Diarrhoea alone accounts for one in three deaths of children under five – 260,000 child deaths a year.

This picture has been little altered by a major Bangladesh success story in providing safe water to almost the entire population – despite the poverty for which the country is well-known. In the 25 years since independence, there has been a revolution in drinking habits. A generation ago, people drank water from open ponds and streams. Today, almost everyone drinks water from protected tubewells.

Key data:

Population living in high water-table areas: 64%

Population living in difficult water supply areas (non-high water table): 36%

Incidence of diarrhoeal disease: 65 m episodes in under-5s a year.

Under-5 deaths from diarrhoeal disease: 260,000 a year, or 1 in 3 child deaths

Incidence of parasitic infestations: 85% of under-5s

This behavioural change was promoted via widespread government installation of the handpump-tubewell. This community and household item has now been fully absorbed into the consumer mainstream, despite the very low income of the average rural family. Today, because of it, 97% of the population drinks safe, protected water. However, this has led to surprisingly little reduction in water- and hygiene-related sickness.

Disappointing as this is, the change in drinking habits in Bangladesh is not a failure, but a first step. The public health authorities know that poor human waste disposal is even more influential in spreading disease. And the sanitary latrine has yet to become as widely-desired a consumer item as the handpump-tubewell, although its popularity is growing.

The authorities also know that it is not the presence of a pump or a latrine which makes the critical difference in improving people's health. What counts is their understanding of these amenities' health-improving virtues and whether and how they use them. Hygienic behaviour — especially in relation to hand-washing and food — is the key.

Bringing about new revolutions in hygiene habits remains the outstanding environmental health challenge in Bangladesh. This is the task which the public health authorities and their partners — internal and external, non-governmental and governmental, donor and beneficiary — are now pursuing. At the same time, they are having to deal with new problems. The water table is dropping, leaving increasing areas of the country seasonally water-short. And in some pockets, its decline seems to be causing hazardous chemical reactions and releasing arsenic into the groundwater.

Ever since Bangladesh came to independence, UNICEF has been at the heart of a conjunction of partners promoting safe water and sanitation with, and alongside, the government. It has pump-primed new programme models, explored new technological frontiers, promoted involvement by the private sector, boosted the interest of the political establishment and the participation of civil society especially women and youth.

UNICEF remains committed to the vision of clean living in Bangladesh and convinced of its special role in helping make that vision come about. This publication sets out to assess past and present water and sanitation activities, and argues that the necessary transformation in environmental health is now within the country's grasp.



Bangladesh: an environmental health challenge

Bangladesh sits astride the confluence of two of the mightiest rivers in the world, the Ganges and the Brahmaputra, and is home to a third, the Megna. Apart from the Chittagong Hill Tracts in the south-east and upland areas in Sylhet, the country is low-lying. Its patchwork of land is distributed among thousands of tributaries of the great rivers, converging and widening as they descend into the Bay of Bengal. At the delta's edge, Bangladesh becomes a skein of islands, many barely above sea level.

Every year during the monsoon months from May to September, the melting snows of the Himalayas swell the rivers high above Bangladesh. This snowmelt travels thousands of miles through Nepal and India before it arrives in the delta plains. Since the mid-1970s, the Farakka Barrage above Calcutta has diverted Ganges water away from Bangladesh. But a treaty between India and Bangladesh signed in December 1996 has opened a new era in the sharing of the aqueous Himalayan harvest.

For Bangladesh, this is desperately needed. The country's agricultural productivity depends on the annual inundation, which permits it to support by the thinnest of margins an extremely high population density. Every year, more than one-third of the country is flooded. Thousands of villages become encircled by sheetwater and rice paddyfields, accessible only by boat or via precarious bridges and causeways.

The monsoon can also bring tragedy. Bangladesh is subject to violent cyclones and storms sweeping in from the Bay of Bengal. In April 1991, a devastating cyclone took an estimated 138,000 lives and disrupted the homes and farms of millions of others. And when swollen waterways rise too high — in 1988, nearly 60% of the country was flooded — thousands of homesteads are washed away. Even in a normal year, river banks are eroded, paddyfield lost, livestock drowned, and around 20,000 people made homeless by one hazard or another.



Water and lifestyle

The way water shapes the landscape has a profound effect on every aspect of people's lifestyle and behaviour — not only economic, but social and cultural. For Bangladeshis, a landscape only partially awash appears dry. Daily lives are conducted in intimate contact with the water around them. It waters their crops, provides plentiful fishing grounds, is a highway and a leisure zone. Water also has an important spiritual value.

But a rural environment flooded equally with water and people takes on the character of an open drain. Streams and rivers flow freely through densely populated communities, collecting their residue of dirt and germs. The constant mingling of people, their waste and surface water constitutes a public health problem of unparalleled proportions; yet a problem only dimly perceived by most Bangladeshis.

In rural Bangladesh, there is no engineered public health system which confines the water supply in pipes and faucets and removes liquid wastes hygienically. Nor could there be, within any imaginable time-frame. In the cities and towns, a small proportion of inhabitants have running water in their homes, septic tanks or sewer connections.

Since time immemorial, the people of Bangladesh have been their own environmental engineers, shifting soil, deepening ponds, carving out platforms and steps and taming water to their domestic convenience. They have created bathing places, reservoirs, ornamental ponds, shrines, livestock watering holes and laundry areas in rural and urban areas alike. But few appreciate their germ-laden condition.

People bathe once or more a day in ponds and streams, carefully removing their clothes to wash them. Children swim in them, emitting a stream of water from their mouths as they surface. The same ponds and streams are used for garbage disposal or, when it rains, become a sewer for excreta deposited in surrounding bushes. Dishes and kitchen utensils are washed on their banks, from which bamboo walkways lead to 'hanging latrines' perched above the water's edge. All these practices pose risks to health. Yet villagers are no more likely to separate themselves from the water surrounding them than try to walk on air.

Water- and dirt-related disease

The consequences of living in such an environment are self-evident. In 40 of the 50 diseases prevalent in Bangladesh, including diarrhoea, dysentery, typhoid, parasitic worm infestation, measles and polio, unsafe water and human excreta clinging to fingers are the main causes of transmission. Every year, children under the age of five suffer 65 million bouts of diarrhoea. Apart from causing one in three young child deaths, this caseload of sickness is a major contributor to malnutrition from which — in some degree — over 90% of young children suffer.

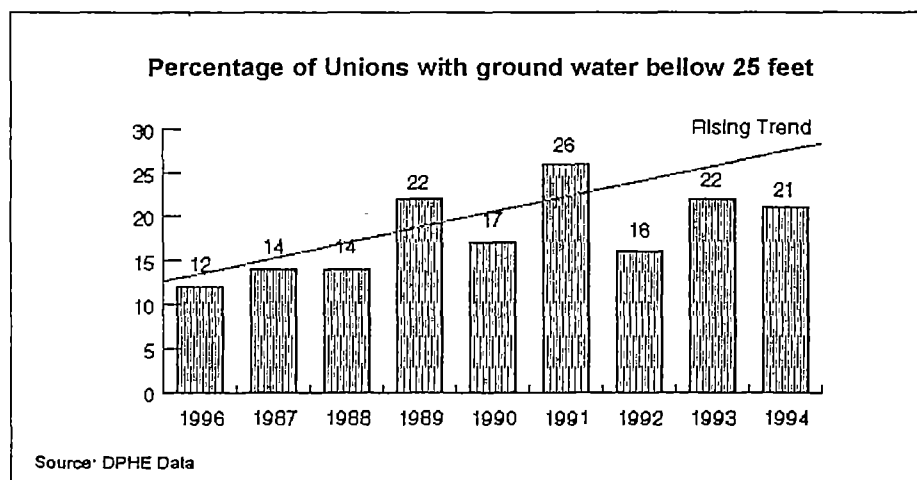
Safe drinking water is the first line of defence against hygiene-related sickness. And in Bangladesh, safe drinking water via the handpump tubewell is a potentially standard amenity for almost every inhabitant. The country sits upon a vast, spongy aquifer replenished by the annual rains and inundation. As the floods recede, streams and ponds dwindle and the water table drops. But in much of the country it remains high—above the 8 metres from which water can be lifted by suction.

The proximity of the water table is not the only hydrogeological blessing Bangladesh enjoys. The groundwater lies in layers of silty clay and sand with few rocky obstructions. The layers act as a sieve, filtering polluted surface water as it percolates down. The soft soils mean that a tubewell can be sunk to a depth of 100 metres purely by the use of human energy. The local technique known as 'sludging' requires no mechanical equipment and is within the capacity of a handyman. Once the tubewell has been sunk, a few extra dollars purchases a suction handpump.

These favourable water supply conditions do not apply universally. In the coastal belt inhabited by 12% of the population, sludging cannot be used for sinking tubewells. Here, the groundwater at 100 metres is saline and it is necessary to go much deeper. Sinking costs for deep tubewells are many times as high as for shallow. And in highland areas, in the north-east and in the Chittagong Hill Tracts, mechanical drilling, rainwater harvesting or other technologies have to be applied. The terrain and scattered human settlement further complicate water supply provision.

The declining water table

In recent years, Bangladesh has faced a new problem. Because of the extraction of water for irrigation and the decreased volume of the average annual flood, the water table is declining. In 1986, the groundwater was below the 8-metre suction zone in only 12% of the country. In 1994, this proportion had risen to 21%. Some predictions suggest that by 2000, as much as 50% of the high water-table areas may find their suction pumps without yield during the dry season.





This means that more call will progressively be made on handpumps capable of raising water from below the suction level. These 'deep-set' pumps are much more expensive than the standard 'Number 6', although the specially developed 'Tara' pump which operates by direct action is still a relatively modest investment at around \$150.

From the Bangladeshi villager's point of view, water shortage in a lengthening dry season is cause for anxiety enough. But from a public health point of view, the declining water table has other implications. People may revert to drinking water from open ponds.

The problem water areas, which altogether contain 36% of the population, therefore need extra water supply attention. They also contain additional contamination problems. Salinity in the coastal belt leads to high levels of chloride in 84 *thanas*¹ (sub-districts). In the hilly areas, 77% of tubewells discharge water with a high iron content (as do 43% of tubewells in other areas). Water with too much iron discolours food, teeth and clothes and causes stickiness in people's hair. Its taste is much disliked – causing reversion to pondwater for drinking.

A new contamination scare is now causing deep anxiety. During 1996, arsenic poisoning in groundwater samples was found in 17 districts in the west of the country. Heavy extraction of groundwater is thought to have triggered changes in the soil, activating release from an arsenic seam straddling the border with West Bengal. Around 700 Bangladeshis so far have been treated for serious arsenic poisoning. Understandably, people in affected areas now distrust tubewell water.

Safe drinking water is a pre-condition for hygienic living. But however important, it is no more than that. Not only the drinking water supply but other features of the environment and people's interaction with it have to be hygienized. The process of embedding such ideas in the Bangladeshi mind has lagged behind the provision of the necessary amenities. Value systems and lifestyles have, until recently, been given less attention than problems of engineering.

The story of water and sanitation activity in Bangladesh is a story of major achievement. It is also a story of discovery and lessons learned. It is to that story we now turn.

¹ Bangladesh is administratively divided into 5 divisions, 64 districts, 490 *thanas* (av. population 235,000), 4,451 unions (av. population 20,000).

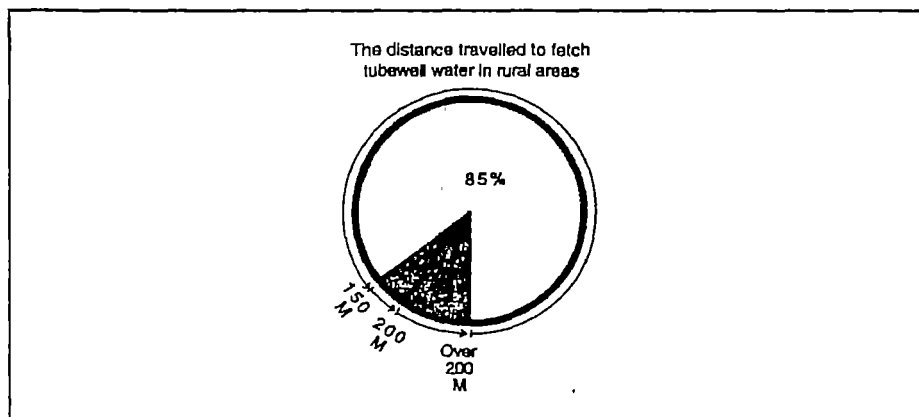


Water and sanitation: a programme evolves

During the 25 years since independence, the coverage record of the Bangladesh rural drinking water supplies programme has been outstanding. In spite of rapid population growth, sufficient handpump-tubewells have been installed to bring safe drinking water to 97% of the population.

The distance women must walk to fetch drinking water has been reduced. In the 1970s, 60% of households lived within 250 yards of a tubewell. Today, 85% live within 150 metres. The average number of people per tubewell has also dropped, from 400 in 1970 to 92 in 1993.

Improvements in sanitation coverage are also impressive, if not as complete. In 1980, only 1% of the population used a latrine which safely confined human waste. By 1995, this proportion had risen to 44% — although some estimates are lower because even 'sanitary' latrines are not sanitary unless used and maintained properly. Latrines have long been in use in Bangladesh and a high proportion of rural families have one. But if they empty into waterways or their contents become exposed to the elements, they do nothing for environmental health. By any criterion, sanitation coverage is still far from universal.



Rural drinking water supplies

The national rural drinking water supply programme was inaugurated in 1972. The war of liberation had caused much destruction to existing installations so UNICEF offered assistance for a crash programme of handpump-tubewell rehabilitation. The Department of Public Health Engineering (DPHE) in the Ministry of Local Government was rapidly built up between 1972 and 1976 to oversee the programme. Thus began the DPHE-UNICEF partnership which has continued to navigate the programme ever since.

In the 1970s, the main emphasis was on hardware. Pump breakdowns, clogged tubewells, and corroded iron pipes were the hallmarks of pre-1972 installations. While DPHE built up its human resources and developed logistics and managerial systems, UNICEF set out to identify the waterwell technologies best suited to the environment. The two key criteria were durability and low cost. And today, applying the same criteria, UNICEF remains the programme's R&D mentor and primary investor.

In the early 1970s, PVC piping was introduced for tubewell casing. Bangladesh soon set up its own PVC industry — the first of many technology transitions. A redesigned cast-iron handpump, the 'New No.

6', also began local production. This cheap and sturdy workhorse remains the country's standard suction pump. It soon entered the local economy, boosting the market in tubewell construction and creating thousands of jobs in local foundries and consumer outlets.

Having laid the technological groundwork, DPHE and UNICEF then attended to programme structure and sustainability. Key issues were maintenance and community involvement — two sides of the same coin. If the community had no notion that a DPHE-installed tubewell was a service under their control, they did nothing to keep it in repair. Everything was left up to DPHE mechanics. As numbers of tubewells mounted into the hundreds of thousands, this became managerially unsound.

Women: chief water haulers and water users

Women's key role in the collection, management and use of household water supplies makes them the primary beneficiaries of services. Research shows that girls start water-carrying as young as five, and that women aged 21-25 spend between 1 and 5 hours a day fetching water. Their water-related behaviour is decisive in terms of family hygiene and health.

But women operate under constraints in Bangladesh. Their mobility outside the home is restricted by cultural tradition. They tend to eat less well than men. And their educational standard — and therefore their knowledge about how to protect health — is lower. Consequently, it is necessary to make special efforts to reach out to women to involve them in issues of access and water and sanitation usage.

The introduction of the handpump caretaker system, and insistence on female participation, was the first step in this context. Since the 1980s, many initiatives in the sector have singled out women for special attention. But they cannot do what their menfolk disapprove. So men, too, need to be targeted to reach women effectively.



The key programme evolution was decentralization. The main locus of DPHE supervisory activity was placed at thana level. A system of community application for tubewells was introduced. User groups applied to their union parishads (committees), which then submitted a list to the thana authorities. This allocation system remains in force today.

The community application form has to list 10 families in the user group and agree to certain conditions: a cash contribution, siting the tubewell in a public place, and the nomination of a 'handpump caretaker'. Today, there must be both a male and a female handpump caretaker for every tubewell. These conditions were imposed for reasons both of efficiency and equity. The programme has always tried to ensure that the most disadvantaged families – those with fewer and dirtier ponds, less local clout, and fewer resources to install tubewells of their own – did not get left out. And it has increasingly tried to expand the participation of women.

Water committee

During the 1980s, many NGOs began to promote tubewells among their beneficiaries. Since NGOs almost invariably focus on the poor, this was one way of structuring water supply assistance to reach the least well-off. UNICEF entered into an agreement with the Grameen Bank that members of their savings groups – all of whom are extremely poor and over 90% of whom are women – could take out loans for private tubewells.

When the problem of the declining water table began to emerge in the mid 1980s, UNICEF and DPHE addressed the new technological challenge. What was needed was a pump able to extract water from just below the suction level. Most deep-well handpumps were designed for lower depths and were correspondingly expensive. To fit this hydrogeological niche, a new direct-action pump was developed jointly by UNICEF, the World Bank and the Mirpur Agricultural and Training School (MAWTS). The 'Tara' pump started production in 1987, and has since become the standard pump for low and marginal water table areas.

The number of public tubewells installed by the government is now close to one million. More significantly, another 1.5 million have been privately installed. People in high water-table areas are now well-served and if they want more tubewells they can obtain them either from private suppliers out of their own pocket or by individual or group NGO loans. As a result, UNICEF has ceased to subsidize the installation of public No. 6 handpump-tubewells via the DPHE programme.

The underserved and poor water quality areas – low water-table areas, the coastal belt, highlands, chemically contaminated area, city slums – now demand the lion's share of water supply attention. In some of these areas over 200 or 300 people share a source, installation costs are high, and salinity, iron or other contamination often requires filtration. Today, water supply problems which used to seem marginal because they affected only a small proportion of the population have moved to centre stage.

Rural sanitation

The story of rural sanitation in Bangladesh is very different from water supplies. The centre stage problem for the sanitation programme is still universal coverage. The mass promotion of the sanitary latrine began much later than mass promotion of the handpump-tubewell. This was mainly because there was little demand for a sanitary latrine and no easily affordable technological formula only awaiting mass promotion.

The best-known sanitary latrine in Bangladesh was imported from Thailand by UNICEF in the early 1960s. The bowl, set in a concrete slab, is like a conventional lavatory pan with a U bend water-seal at the base. When flushed by a jug of water, the water provides a barrier between the waste below and the open air. Placed near a water source, built over a well-lined pit, surrounded by a bamboo superstructure and regularly cleaned, this latrine is secluded, hygienic and odourless. But it is not cheap.

The first comprehensive effort to promote the sanitary latrine began in 1978. Along with five concrete rings for the pit lining, the water-seal latrine slab was manufactured in 100 thana production centres and sold at a highly subsidized price as a package. Take-up was encouraging — although tiny in relation to the total target population. By the late 1980s, latrine shops selling water-seal slabs and concrete rings had begun to appear in the bazaars of many large towns. By the early 1990s, DPHE had

established production centres in all 460 thanas and 540 at union level.

Village sanitation centres

Since the first DPHE village sanitation centres were set up in 1978, there has been a major expansion in latrine production in both the public and private sector. A review carried out in 1994 found that, including the 933 sanitation centres run by the DPHE, there were 4,152 producers of latrines in Bangladesh, 61% of which were private and 11% were NGO. Around two-thirds were in rural areas.

The latrine products they supplied ranged from a simple slab with a hole, to slabs with pans and water-seals, pit lining rings of various kinds, and pipes for off-set pits. Most transported their products by road, but some used boats to market their wares throughout the countryside.

Although latrine items sold through DPHE centres are subsidized, many people prefer to patronize private producers. They are more accessible, have managed to keep prices low and competitive, and provide better after-sales servicing. However, most people are too poor to afford the quality 'sanitary' model, instead purchasing a simple slab and lining their pits with natural materials such as branches.

However, even at a subsidized price the water-seal pit latrine is outside the financial reach of the great majority of households. A quest began for cheaper alternative designs. Soil tests have shown that in many areas of the country, pit lining with concrete is not essential. Woven bamboo, baked clay or even packed earth may be adequate. And though preferable from an olfactory point of view, a water-seal pan is not essential either. A slab with a hole and removable cover is much cheaper and will be 'sanitary' if firmly fixed so that wastes do not wash out at times of flood.

In the early 1990s, the country-wide sanitation programme moved into a much higher gear.



Local masons were trained to make and supply water-seal latrines. The home-made sanitary pit latrine was also increasingly promoted, and successful latrine-building campaigns in certain areas began to dispel the widespread scepticism concerning the prospects for a sanitary revolution in Bangladesh.

This was the point at which UNICEF introduced a new approach to sanitation and latrine promotion: social mobilization. The then Prime Minister agreed to launch an annual 'Sanitation Week' in which society would be mobilized around sanitary latrine construction and hygienic living. Coupled with expanded latrine production in both public and private sectors, this drive has raised coverage to 44% in a few short years.

Hygiene education

At every stage in the growth of water supply and sanitation coverage, the programme's accomplishments have been accompanied by the realization that installations by themselves do not transform public health. Emphasis on safe water gave way to emphasis on the sanitary latrine; but among a population uninformed of the need for hygiene, higher coverage rates still failed to produce a significant reduction of ill-health.

Although lip-service was paid to the need for health education from the late 1970s onwards, the lack of progress in educating people about the connections between water, cleanliness and disease reduction was a constant theme of surveys and programme assessments. One of the problems was that the DPHE was an engineering, not a health promotion body. And hygiene education has not been seen as a central task of the government's health service infrastructure.

During the early 1990s, coinciding with the inauguration of the annual Sanitation Week, efforts have been concentrated on developing a comprehensive hygiene promotion agenda. As at so many earlier stages in the programme, UNICEF has acted as facilitator in developing this new evolution. Key messages and communications vehicles have been tested. Different strategies have been piloted with different audiences — schoolchildren, householders, teachers, community and religious leaders.

Clean living and environmental protection thus remains the outstanding challenge. And a campaign for clean living requires a radical change in perspective about what is demanded of a water and sanitation programme beyond the achievement of coverage targets. Nonetheless, there are grounds for hoping that Bangladesh now has the will and the way to take a great hygienic leap forward.

Changing perspectives: sustainability and safe behaviour

During the International Drinking Water Supplies and Sanitation Decade (IDWSSD) 1981-90 and around the 1992 Earth Summit, a great deal of rethinking took place concerning humankind's interaction with the natural environment. This re-thinking has been mirrored at national level, especially in countries such as Bangladesh. With its water-dominated economy and lifestyle, Bangladesh is an environmental laboratory from which both its own water and sanitation programmes and others can learn.

Certain key principles have now come to dominate sectoral perspectives. One of these is that the environment is a reservoir of natural resources whose contents must not be depleted in an unsustainable way. Water is not 'free' any more than precious metals are free; water must be seen as a commodity with realistic price-tag. It follows that costs must be recovered and users' energies deployed. Appropriate facilities for low-income communities mean those that are within their comprehension, technological participation and consumer reach.

Another important principle is that the environment and its natural resources need to be viewed holistically. Water resources, their quality and quantity, and contamination in the environment are the concern of everyone, not just public health officials and engineers. In a country such as Bangladesh, private behaviour has a bearing on environmental management; the correct treatment of ponds and waterways and the security of pathogenic latrine contents from open exposure are an individual, household and community responsibility.

The ascendancy of principles such as these has had a profound effect on the management of national water supply and sanitation programmes. If people are to become partners in service delivery instead of passive recipients, the authorities' role too must change. Instead of being omnipotent providers of services, water supply departments need to become advisors, facilitators and overseers of work carried out mainly by

communities and private suppliers. Engineers must continue to be the guardians of public health, but not its sole dispensers. Certain powers and responsibilities need to be devolved to households and communities.

In Bangladesh, the need for reorientation of DPHE towards a facilitating role has been accepted. A review carried out in 1994 also recommended that its capacity for social mobilization and behavioural change be built up, and that greater attention be given to R & D, and to the role of women – professionally and among service users. An extensive programme of training and reorientation has been put in hand

Meanwhile, the process of handing over to the private sector the manufacture and installation of tubewells and latrines has been strongly promoted by UNICEF – even though DPHE has felt some anxiety about losing control of quality in 'its' sector. However, standards for handpumps and other ingredients of the water-well industry have been established with the aid of the Bangladesh Standards Institute. Other monitoring mechanisms are being put in place. But ultimately, the real control must rest with the users. In turn, they need to be sufficiently informed and knowledgeable to demand quality items and service at realistic prices.

accountability

Tackling the behavioural issues

Information and knowledge interact with beliefs and practice. Alongside institutional change in the sector has come a determined effort to develop a much clearer picture of people's hygienic understanding. Those planning and providing services needed to know why people continue to live unhygienically and how the health-protection potential of safe tubewell water comes to be nullified between pump spout and lip.

Anthropological studies have been commissioned to explore uses of tubewell water and pondwater, defecation practices, hand-washing habits, and household water storage methods. Results have been highly revealing.

Although over 90% of Bangladeshis know of a link between safe drinking water and good health, only 16% of rural households use tubewell water for all domestic needs. For bathing, laundry and cooking, pondwater is preferred. This is partly because of longstanding custom, as well as taste and convenience. But it also reflects different value systems. It turns out that some people believe tubewell water is too 'cooling' to be healthy. And many rural people feel that pondwater immersion is more purifying for the body than washing with tubewell water.

Cultural

Researchers have boldly questioned people about their most intimate personal habits. As far as defecation is concerned, the main users of latrines are women – for reasons of privacy and convenience rather than disease prevention. Although the connection between diarrhoea and drinking water is appreciated, the faecal-oral, hand-to-mouth route of

diarrhoeal infection is not. Young children are not usually expected to use the latrine, their faeces not thought polluting, and soiled napkins and bedding are rinsed in ponds without a thought.

Hand-washing practices owe more to notions of ritual de-pollution than to personal health. After defecation, most Bangladeshis wash their hands using some form of rubbing agent — soil, ash, or soap. But many only wash their left hand. They think the right hand is clean. Tests show that both remain highly contaminated unless rubbed thoroughly together. Many people also dry their hands unhygienically, on their clothes or a soiled rag. And mothers do not wash their hands properly after cleaning

their child's bottom. Very few people understand the need to wash hands before eating or preparing food rather than afterwards.

Water storage practices also leave open all sorts of possibilities for pathogens to wreak their havoc. In many households, both tubewell and pondwater are stored, and children use the pots indiscriminately. Dirty hands come into contact with the water, and containers are often heavily contaminated. Women often do not wash the pot thoroughly before filling it and within two hours of collection, the stored water's bacterial count can be dangerously high.

Interestingly, people living further from a tubewell seem to suffer less from diarrhoea. They take more care of their stored water supply, using a container with a lid instead of an open jar, and have not got into the habit of cupping their dirty hands under the pump to take a drink.

Many of these studies show varying patterns and different levels of knowledge. It is difficult to draw definitive conclusions about the elusive software 'fix' which would finally unlock the Bangladeshi environmental health puzzle. The answer may

Barisal: a sanitation success story

In 1990-91, an intensive sanitation campaign was conducted in three thanas of Barisal district: Banaripara, Gourmadi and Agoiljhara. The success of this campaign has had a lasting impact on the whole strategy to promote clean living in Bangladesh.

The keynote of the campaign was alliance-building. It conducted by local DPHE engineers with the involvement of thana and union officials, fieldworkers from the departments of family planning, social services, agriculture, public health and education, NGOs, Village Defence Party cadres (*Ansar*). Special importance was attached to participation by teachers and students in secondary schools and *madrassas*.

In Banaripara, the Sub-Assistant Engineer and the thana development officer determined to 'do something different'. They divided each union into 20 areas, and on a given day, groups consisting of 12 different people went to a designated area and held courtyard meetings. The whole population was covered in a single day.

The campaign consisted of strong injunctions to destroy insanitary latrines and construct sanitary ones in their place. Demonstration latrines were built, processions held, and leaflets distributed. School students were enlisted to instigate latrine building at home and neighbouring compounds, and prizes for high achievement were awarded.

In Banaripara, 80% coverage with sanitary latrines was achieved. The two other *thanas* managed to reach 60%. But questions still remain about people's commitment over the longer term to their proper maintenance and hygienic usage.



be that there is no one single approach; several need to be interwoven. What is crystal clear is that, almost universally, there is a vital knowledge gap about faecal hazard — in the environment, in surface water and on hands, bodies and clothing.

A 1994 survey in Barisal district undertaken by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) bears this out. Here, a highly effective 1990-91 campaign in three thanas integrating latrine construction with tubewell installation resulted in 60% sanitary latrine coverage in two thanas and 80% in the third (see box).

Three years on at the time of the study, high rates of latrine use were still being maintained in Barisal. But relatively few households sufficiently understood the connection between faecal matter and disease to use their latrines so as to secure themselves from contamination. Around 80% of children's faeces were not put in the latrine; high faecal coliform counts were found on people's hands (both right and left) and in water storage jars; and many latrines were too poorly maintained to be environmentally safe.

Clearly, it is not enough to say in rural Bangladesh: 'Build a sanitary latrine', or even 'Use the latrine'. People's hygienic ignorance and bad habits demand a new evolution in programme thinking. Behavioural change has to be at the centre of any programme strategy, alongside the creation of supply and demand for facilities. The sustainability of services needs not only sound and cost-effective technology and management; it needs user knowledge and attitudinal endorsement too.

Today's water and sanitation programme in Bangladesh is now grappling with the profound behavioural challenges which have impaired its past child health impact record.

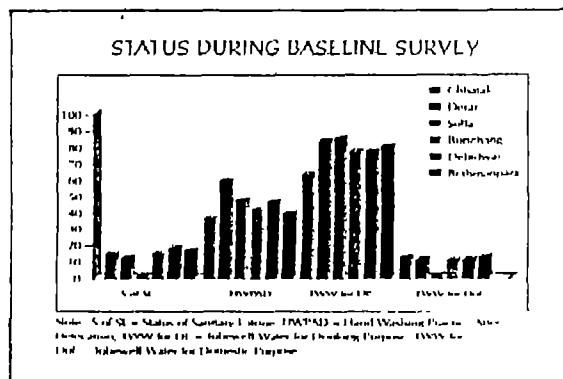
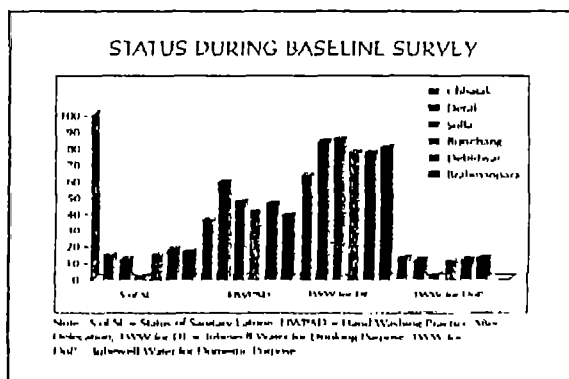


Building momentum behind thinking clean

During the 1980s, the strategy of 'social mobilization' was developed by UNICEF to build momentum behind the goal of universal immunization. During the 1990s, UNICEF has fostered the incorporation of social mobilization techniques into the drive for sanitation in Bangladesh.

People in Bangladesh are great enthusiasts for grand events, national 'Days' and rallies. There is a huge resource of popular energy to be tapped behind the cause of good health. On annual National Immunization Days, volunteers turn out in their thousands to sing, march, carry banners and see that mothers deliver their unimmunized babies to the vaccination posts. The idea of tapping the same kind of energy behind thinking clean was the underpinning rationale for the inauguration of 'Sanitation Week' in 1994.

However, the story of social mobilization for sanitation goes further back and is much broader in scope. In 1992, a national conference on social mobilization for sanitation was inaugurated by the then Prime Minister, heralding a new political willingness to tackle the sensitive subject of environmental pollution by human wastes. A national sanitation logo was launched, with three messages for health: use a latrine, wash hands, and use tubewell water for all domestic purposes.





From this point onwards, UNICEF and DPHE systematically set out to implant the cause among all possible partners. Social mobilization involves building a movement at all levels of society whose purpose is to reach a common goal. Each motivated partner from government, civil society, religious and professional institutions brings their own skills and knowledge, their network of contacts, and mobilizes their group resources to reach their target audience. Each feels a sense of reward from contributing to a mass, joint effort — which also gains momentum from publicity since the media are also important partners.

One of the most important groups to put their weight behind hygienic living at an early stage were the country's imams. In 1993, at a special imams' conference also inaugurated by the Prime Minister, stress was placed on the religious virtues of cleanliness. At subsequent workshops, imams were invited to take the lead in promoting latrine coverage in their communities. Many responded vigorously to the call and have since sustained their involvement, with special drives during 'Sanitation Week'.

NGOs involved in water and sanitation have played a leading part in the social mobilization movement. An NGO Forum for Drinking Water and Sanitation was created in Bangladesh in 1982. It has a well-developed infrastructure for supporting NGOs at community level, helping them to promote tubewells and latrines to their beneficiaries. The Forum was ideally placed to promote hygienic behavioural change. Its 560 NGO members have a greater proximity to households than any government service.

In 1993, the NGO Forum embarked on a special three-year social mobilization project in 20 thanas. Orientation workshops with local NGOs and discussion forums with local imams paved the way. Motivational activities ranged from latrine construction demonstrations, household visits and courtyard meetings, to discussions with Village Defence Party cadres (Ansar), health and family planning workers, film shows and rallies.

Meena's three wishes

Meena and her parrot, Mithu, have become firm favourites among Bangladeshi children since the first Meena cartoon was launched in 1993. The cartoons are shown all over the country for entertainment — and education.

In '*Meena's Three Wishes*' Meena becomes an advocate for a safe and healthy environment. The genie of the lamp gives her three wishes, and instead of opting for gold, jewels and a handsome prince, Meena asks for the power to persuade people to use latrines, use tubewell water for all domestic purposes, and wash their hands at the proper times.





In promoting latrine installation and hand-washing the programme achieved near universal success. Only in promoting the use of tubewell water for all domestic purposes were results less dramatic (*see box*). This pattern is beginning to become familiar, and is prompting re-consideration as to whether efforts should instead be devoted to promoting pond cleanliness. Expecting women to shift over entirely, and permanently, to tubewell water for all domestic use may simply be unrealistic.

From 1993 onwards, DPHE began to develop its own capacity for social mobilization and communication. This was not an easy transition: not only was a body devoted primarily to engineering trying to become a force for communication of sanitation messages; it was being asked to motivate and recruit others to join in a multi-faceted sanitation movement, not simply spearhead its 'own' sanitation campaign.

A core communications package for use in all social mobilization activities was developed with UNICEF assistance. Based upon it, training packages were also developed for all sorts of audiences with influence among householders: community leaders, teachers, imams, field workers, tubewell mechanics and masons. District teams were set up to carry out a programme of training sessions. Their participants were expected to set an example in their own communities by building, using and maintaining sanitary latrines. They are also supposed to spread correct messages about hand-washing with soap or ash and hygienic defecation.

Since the first 'Sanitation Week' in 1994, this event has grown both in types of activities and in the scale of local participation. Many NGOs are actively involved – not only those who are members of the NGO Water and Sanitation Forum, but organizations with a national spread such as the Bangladesh Rural Advancement Committee (BRAC), the Village Defence Party or Ansar cadres, the Boy Scouts, Girl Guides, and religious groups. NGOs conduct their own activities – marches, rallies, poster campaigns – as well as joining forces with those organized at thana and union level.

The 'Sanitation Week', held in December, acts as a climax to the year's social mobilization activity. Schools run essay competitions. Boy scouts build latrines in hospital compounds and market places. Bill boards are erected, TV spots are broadcast and theatre performances given. Every year, more emphasis is placed on practical activity. Union parishads set targets: each village to construct five sanitary latrines during the week. Awards are made to high-performing unions – one per thana – and their achievements blazoned by the media.

Although no formal evaluation of the impact of Sanitation Weeks has been undertaken everyone regards them as a great success. They have undoubtedly contributed to the mounting coverage of latrine construction. But questions remain about ~~lasting changes in behaviour~~ and whether, without them, improvements in coverage will translate into lower rates of diarrhoeal disease.

Hygiene education: a drip-drip affair

Social mobilization has made its mark on latrine coverage. It has yet to make as decisive a mark on hygienic behaviour. Rallies are fine for instant behavioural action. But only long-term re-enforcement will create the circumstances for permanent behavioural change.

Hygiene education on a continuous basis household by household, village by village, still remains the poor relation in the DPHE-led water and sanitation programme. For people to keep their latrines environmentally secure, for household members to change their defecation and hand-washing habits definitively, this will have to change. What is needed is a thorough educational process, not occasional village meetings or one-off campaigns. The 'Union Watsan Committee', the community mechanism intended to oversee ongoing sanitary activity in the villages, has not yet managed to become functional in more than a handful of places.

NGO experiences bear out the need for an intensive, long-term approach to hygiene education, especially regarding faecal risk. Between 1992-93, an NGO called PRISM ran a UNICEF-assisted 'social mobilization for sanitation' project in Ramgoti thana in Laxmipur district. From this experience, many useful lessons were gleaned.

The project strategy was to conduct a process of interpersonal communication with the entire population of 56,500 households. This was undertaken by 133 — mostly female — Village Sanitation Motivators. Each visited around 425 households at least four times and held numerous community meetings, including with the village men. The continuous process of dialogue allowed problems and misconceptions to be ironed out as the project continued. Results were impressive. After 15 months, sanitary latrine coverage had risen from 3% to 59%. But for solid behavioural change, PRISM believed that 15 months was not long enough. Without some system of continuing visits, project leaders were sure that good hygiene practice would not yet be sustained.

Embedding new convictions in seasoned minds is the main obstacle to behavioural change everywhere in the world. This is why, increasingly, UNICEF is looking to the younger generation — children in school — to lead the cleanliness revolution Bangladesh so badly needs.

Sanitation in school: starting young

Since social mobilization became a key strategy for sanitation promotion in Bangladesh, teachers have been very actively enlisted. The influence of teachers extends beyond their students, to the community as a whole.

Among adults, the health arguments in favour of hygienic behaviour have yet to take a strong hold. Most Bangladeshi women are motivated to use a latrine by the desire for privacy — a privacy ever more elusive as bushes

Barisal: a sanitation success story

In 1990-91, an intensive sanitation campaign was conducted in three thanas of Barisal district: Banaripara, Gournadi and Agoiljhara. The success of this campaign has had a lasting impact on the whole strategy to promote clean living in Bangladesh.

The keynote of the campaign was alliance-building. It conducted by local DPHE engineers with the involvement of thana and union officials, fieldworkers from the departments of family planning, social services, agriculture, public health and education, NGOs, Village Defence Party cadres (*Ansar*) Special importance was attached to participation by teachers and students in secondary schools and *madrassas*.

In Banaripara, the Sub-Assistant Engineer and the thana development officer determined to 'do something different' They divided each union into 20 areas, and on a given day, groups consisting of 12 different people went to a designated area and held courtyard meetings. The whole population was covered in a single day.

The campaign consisted of strong injunctions to destroy insanitary latrines and construct sanitary ones in their place. Demonstration latrines were built, processions held, and leaflets distributed. School students were enlisted to instigate latrine building at home and neighbouring compounds, and prizes for high achievement were awarded.

In Banaripara, 80% coverage with sanitary latrines was achieved. The two other *thanas* managed to reach 60%. But questions still remain about people's commitment over the longer term to their proper maintenance and hygienic usage.



increasingly disappear. For men, a latrine is a household status symbol. Thus, after building a sanitary latrine, adults may gradually revert to their old defecation habits, especially if it fills up and needs to be emptied or replaced, or becomes dirty, dilapidated or flooded in the rains.

Accordingly, more attention is today being focused on children via the schools. Not only must they be encouraged to use latrines and wash their hands, but promote this behaviour at home. The expectation is that, if they absorb new habits and an appreciation of the health consequences, they will maintain them for the rest of their lives. Teachers and children are therefore becoming the country's sanitation pioneers and reformers.

A special School Sanitation Project was launched in 1992. The first object was to ensure that sanitation facilities existed in schools: without the possibility of usage, no progress could be made. With Ministry of Education co-operation, DPHE and UNICEF developed a plan for constructing water and sanitation blocks in primary schools where they did not exist. Criteria were established so that the most needy schools received priority.

Experience showed that school latrines frequently became noxious and were soon abandoned by their users. So great care was taken with the design of the facility. Its core is a tubewell whose hand-pumped water enters a 500 litre tank equipped with a drinking water tap. The tank is raised so that water-pipes from it lead directly to other taps in the latrine compartments. Two of these, back to back, provide a 'girls' and a 'boys' lavatory. The taps allow the water-seal pan to be flushed clean on every occasion. Soap or ash is provided in each compartment for hand-washing.

During the first phase of the project, over 1,000 school sanitation facilities were constructed. The facilities were welcomed, not least because their presence was an incentive for girls to stay at school. In the past, if girls needed to relieve themselves they tended to go home and not reappear. The programme was counted a success. However, an evaluation uncovered various flaws: construction delays, use of poor quality materials, and lack of maintenance by the users. Some facilities were quickly abandoned.

Lack of community involvement and ownership seemed to be the problem. Accordingly the UNICEF Chittagong Divisional Office undertook an experiment in five government schools in Moulvibazaar District. Instead of counting on DPHE to organize construction using local contractors, responsibility was vested in the School Management Committees — by-passing government intermediaries. The necessary funds, materials and the design of the facilities was given directly to the Committees, who employed masons to do the work according to the specifications.

The upshot was that the sanitation blocks were built much more quickly and the quality of the work was higher. In some cases, materials such as paint, locks, taps, and doors were of a superior quality than those specified — because the School Management Committees preferred it that way.



More attention was also subsequently given to maintenance and cleanliness of both water tanks and latrines. As a result, school sanitation construction has now been devolved to School Management Committees in 800 schools in six districts, under the supervision of the thana authorities.

Altogether, in four years, over 2,500 primary schools received facilities, and 32,000 teachers and members of School Management Committees were given training or orientation. New evaluations have found that the standard of cleanliness has improved, with over 80% of facilities well-maintained. Over half the schools now provide soap or ash for hand-washing, and far fewer taps go missing or get broken. Spot checks today show that staff and pupils alike demonstrate enthusiasm for the latrines — as a matter of course.

In the early days of the School Sanitation Project, emphasis was focused on the construction of water and sanitation blocks. As time goes on, more emphasis is being placed on ensuring that personal hygiene and clean living become integral to the schoolchildren's lifestyle. Where education officials are supportive and head teachers are keen, schoolchildren can become a force for environmental health in the community (*see box*).

Some of Bangladesh's non-formal educational programmes have also begun to incorporate hygiene learning into the curriculum. An example is the primary education programme run by Gonoshahajya Sangastha (GSS). Students take up cleanliness as a class project, conducting community surveys, discussing the topic with people in their neighbourhood, and reporting back to school. At the end of the project, the children write a play demonstrating their new knowledge and perform it for the rest of the school and in the community at large.

The latest concept in school sanitation is a 'safe learning environment'. In an experiment in 20 schools in Noakhali district, teachers carry out an inspection of their pupils once a week. They check the state of their dress, hair and sandals, they cut the nails of the younger children, and issue nail-clippers to older ones. They also distribute de-worming pills.

These activities, which are also being carried out in the 800 schools under the new School Sanitation Project phase, are intended as a starting point for study into issues such as waste disposal and protected water supplies. UNICEF is developing a resource pack for schools which explains how to run school gardens, conduct environmental projects and carry out disease surveillance in ways which are instructive and fun. Hopefully, teachers can be persuaded that, with minor adaptations, a hygiene and environmental dimension can be incorporated into the existing curriculum.

Around 45% of the 57,600 government primary schools in Bangladesh still have no sanitation facilities. The goal of the School Sanitation Project is to ensure that all these, and all non-formal primary schools run by NGOs, both have sanitation facilities and are promoting a 'safe learning environment' by the year 2000.

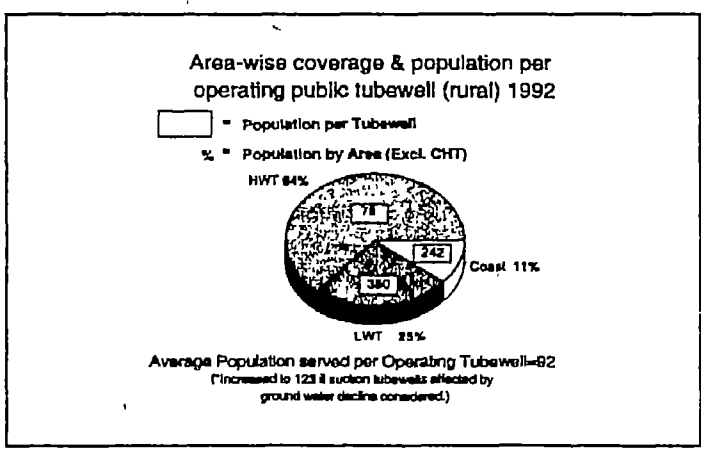
Reaching the unreached: equity and vulnerability

Bangladesh was one of the earliest countries to ratify the Convention on the Rights of the Child following its passage by the UN in 1989. The principle of equity in service coverage has since been more prominent in programmes of UNICEF country co-operation. The need to fulfil the rights of every child imposes an obligation not just to see that the majority of children have access to services, but to take special action on behalf of those outside the reach of facilities serving the mainstream.

As far as drinking water supplies in Bangladesh are concerned, the rights perspective has focused attention on communities in underserved areas — in low water-table areas, in the coastal belt, and in stony highland areas. Since their hydrogeological conditions are much less favourable, tubewell installation costs are much higher. Investment therefore needs to be made in developing the most appropriate and affordable systems.

In 1995, UNICEF provided DPHE with the country's first 'down-the-hole' rig for drilling in hard rock in the Chittagong Hill Tracts. The rig was purchased in India where the hard rock drilling industry is already well developed. As with any introduction of a new and complex technology, the experience with borehole drilling has had teething problems. However, tubewells benefiting 1,500 people have been drilled. Hydrogeological mapping, easier transport of equipment, and further training will be addressed in the next phase of operations.

Another technology to be introduced by UNICEF is rainwater harvesting. In some hilly areas, cost and terrain



difficulties make drilled boreholes impracticable. And in areas where groundwater is contaminated with iron, salt, or — frighteningly — with arsenic, rainwater appears a good alternative. With an average annual rainfall of 2,500 mm over 7 months, rainwater is a plentiful and under-utilized resource. Households in water-short areas do sometimes collect and use it, but unsystematically and in small containers. At present, they do not store it beyond the wet season.

Between 1994 and 1995, trials and studies were undertaken in some coastal districts and Hill Tracts to work out whether rainwater harvesting was worth promoting. Experts from Thailand trained DPHE engineers, Village Sanitation Centre personnel and private masons in how to fabricate ferro-cement jars in two sizes (1,000 litre and 2,000 litre) and tanks of 3,200 litre capacity, and how to fix guttering and down-pipes. The jars and tank cost US\$50, US\$75 and US\$120 respectively; communities and households are expected to provide 50%.

Gradually, interest in rainwater harvesting is growing. Technical drawings for steel moulds and manuals on making the jars have been distributed. Requests have come from other districts to conduct training sessions. After a course in Rajshahi, an energetic Sub-Assistant Engineer from an arsenic-affected thana, relieved at finding a solution to the problem, trained up the local masons who promptly constructed 70 jars. In less motivated areas, take-up is slower. Officials, both government and NGO, are positive about the technology, not least because it is within the range of local technological and financial resources. Quality questions remain: will stored water stay pure over a two or three month period?

Other technological approaches designed to reduce water supply disparities have been developed. Very shallow 'shrouded' tubewells are used in the saline belt. Where conditions are unsuitable for these, regular tubewells are installed in such a way as to discharge into a specially constructed pond with a sand filter. This simple technology greatly improves water quality — if properly maintained. In iron-excess areas, water is similarly pumped into a simple plant which removes iron by aeration and filtration. This, too, depends on motivated consumers to keep it clean.

In most of the low water-table areas, the key technology is the sludged tubewell capped by a Tara handpump. Since the Tara was first developed, over 16,000 of the regular model have been installed. Two adaptations of the Tara — the Tara II and the mini-Tara — are now being tried out on an experimental basis (*see box*).

In sanitation, equity and vulnerability are socio-economic issues. The water-seal latrine favoured by DPHE remains far outside the financial reach of most rural households, and for this reason the home-made pit latrine continues to be heavily promoted. However, efforts are being made to reduce the costs of sanitary latrine components. Tests have shown that it is possible to reduce the thickness — and therefore the price — of the concrete rings sold for pit lining. And in 1995, plastic pans (without water-seals) started manufacture and sale.

Running dry: Tara to the rescue

Every year, more villages in Bangladesh find their handpumps failing in the dry season. Every year, the period during which large numbers of No. 6 suction pumps are inoperable lengthens. Every year, some marginal high water-table areas become low water-table areas. In the worst-affected, the ratio of people to pump rises to 1:500 in the dry season. For many people water shortage is becoming acute.

The Tara pump was developed for tubewells where the water table was below the suction level of 8 metres, but no deeper than 15 metres. The pump becomes too heavy to operate if the water-table is lower than this. Although the pump is inexpensive compared to other deep-set models, it still costs 25 times more than a No. 6. This puts it beyond the reach of most households and many user groups. Thus the fluctuating water-table precipitates communities into a quite different, unaffordable, hydro-economic environment.

The Tara technological options are therefore being constantly expanded. The 'mini-Tara' has been developed as an alternative to a No. 6 when this becomes inoperable; one or two local No. 6s can be converted for dry season use. This is less expensive than total replacements.

The Tara II has been developed as a more sophisticated Tara for drawing water from lower depths. The key difference is that it has a handle on the pumphead. Handles have more lifting capacity and are socially preferred, but they are also much more expensive.

Trials are still going on with these new generation Taras. Some 350 mini-Taras and 150 Tara IIs have been installed to test their community performance. But with all Taras, questions of consumer affordability will ultimately be more difficult to solve than questions with technological answers.

The balance between what is equitable, what is affordable and what is truly 'sanitary' in such an over-crowded, easily polluted, and frequently flooded environment is difficult to strike. DPHE still tends to believe in latrine promotion by subsidies and supplies of better-quality items. UNICEF and NGOs tend to believe in creation of consumer demand for adequate home-made facilities even at short-term environmental health risk. They assume that once the latrine habit is entrenched, families will upgrade to the 'sanitary' model when they can afford to. Unless people have a sound appreciation of a latrine's health benefits it will not be used properly, and 'sanitary' objectives will be defeated.

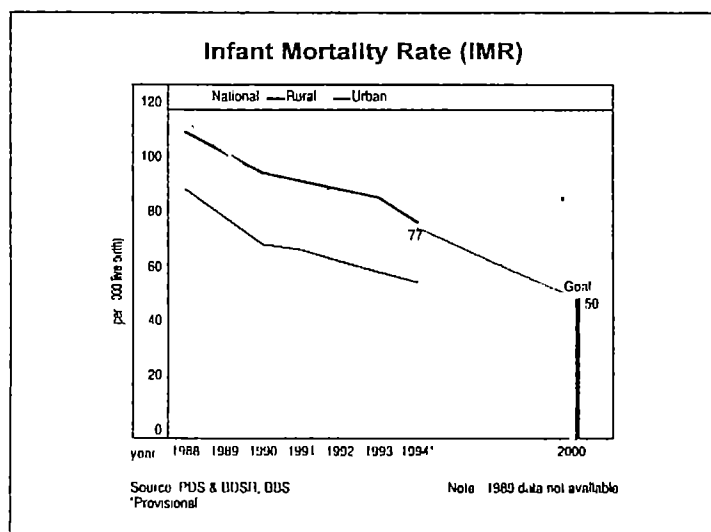
New cost-saving technologies and their promotion are one way to redress disparities. But attention is also constantly given to other types of affirmative action on behalf of disadvantaged groups. The participation of local NGOs is one way of ensuring a focus on the marginalized and most vulnerable. For example, between 1995-96, an NGO called Otkrom in Moulvibazaar district conducted a house-to-house intensive sanitation and hygiene programme in over 2,000 villages and in 60 tea gardens, with support from UNICEF. Without this kind of grass-roots effort, groups outside the mainstream such as the tea garden workers could not be reached.

The promotion of women in NGO programmes and within the water and sanitation profession — as sanitation motivators, mechanics and engineers — helps ensure that women's needs are better catered for and their perspectives better understood. Where it has been evaluated, women employees' performance in social mobilization and hygiene education tends to outclass men's. Although it is difficult to find women candidates in the engineering profession, gender barriers are gradually breaking down.

A disadvantaged group whose situation need more attention is slum and shantytown dwellers. During the recent past, Bangladesh has experienced rapid and unplanned urbanization; Dhaka, already over 8 million population, is one of the fastest growing cities in the world. Although poverty in Bangladesh is thought of as a rural phenomenon, over 50% of urban inhabitants live below the poverty line, and 30% qualify as 'very poor'.

In the slums, occupied by 22% of urban inhabitants, less than one-third of people have access to a public water supply and less than one-fifth to proper sanitation. There is one operating tubewell per 527 persons, and each latrine serves 13 users. Not surprisingly, diarrhoea and other hygiene-related diseases flourish. The Infant Mortality Rate in urban slums is higher than that in the countryside: 142 per 1,000 live births compared to the rural rate of 93 or the national rate of 90.

In spite of the difficulties of service installation in densely-crowded and irregularly occupied settlements, urban-rural disparity in water supply and sanitation service provision needs to be addressed. If no environmental action is taken, the Bangladeshi urban habitat will become a by-word for pollution and a major threat to public health.



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Partnerships and interconnections: a growing network

The network of actors and stakeholders in safe water and sanitation in Bangladesh has grown substantially in recent years. This is a reflection of the importance attached throughout official and civil society, from the top echelons of the political establishment to humble citizens in tea gardens and village schools, to better standards of environmental health. It is also a reflection of the increasing recognition within the public health establishment that infrastructural development and engineering prowess is only one side of the public health coin.

The statutory responsibility for services is vested in the Ministry of Local Government, Rural Development and Co-operatives (MLGRD&C). Within the Ministry, the Department of Public Health Engineering (DPHE) carries the functional responsibility in all rural and urban areas except in the cities of Dhaka and Chittagong, which have their own water and sewerage authorities. In all municipal areas (*pourashavas*), the Local Government Engineering Board (LGED) shares responsibility with the DPHE for water and sanitation infrastructures. In all administrative, technical, infrastructural and management questions, these actors take the lead.

From the inception of the DPHE-administered rural water supplies and sanitation programme in 1972, UNICEF has been its key external donor and source of supplementary expertise. The programme's evolution has provided a remarkable model for donor agency-government sector relationships — with all their hazards of donor dependency and donor interference, all their need for sensitivity and mutual respect in reconciling national with international objectives, ideas and sectoral practice.

At each phase of programme growth, UNICEF has played the role of advocate, experimenter and underwriter — with technologies, with the introduction of innovations such as user contributions and handpump caretakers, with emphasis on women's involvement, and with social mobilization. Whenever an experimental phase has been followed by

mainstream adoption of a new technology or idea, UNICEF has moved on to tackle the next generation of issues. Its close relationship with DPHE has helped smooth transitions, especially the acceptance of software ingredients alongside engineering hardware, and the conceptual shift from a 'do-it-all' to a facilitating role.

Turning points in alliance-building for water and sanitation

- 1972. UNICEF-DPHE partnership launches 'crash' handpump-tubewell programme
- 1974: Private industry involved; local manufacture of PVC pipes
- 1975: Pump manufacturers involved; local foundries produce New No. 6 pumps
- 1976. Communities involved; tubewell user contributions and caretakers introduced
- 1976 NGOs involved: UNICEF allocation to cover NGO installations
- 1978: Masons involved: first DPHE Village Sanitation Centres established
- 1982: NGO Forum created, apex body for local NGOs working in DWSS
- 1982. Partnership between World Bank, UNICEF, MAWTS to develop Tara pump
- 1984: Village *mistris* (handymen) involved: self-help tubewell sinking begins
- 1985. Grameen Bank involved: tubewells on sale or loan basis to members
- 1985: Women involved: handpump caretakers must include women
- 1986: Private masons involved: given training and latrine production start-up capital
- 1987 Tubewell mechanics involved in latrine promotion (integrated approach)
- 1988: Hydrogeological experts involved DPHE groundwater monitoring unit
- 1990: First multi-partnership *thana*-wide sanitation campaign in Barisal
- 1992. Prime Minister involved: launches sanitation logo at national conference
- 1992 Schools involved: School Sanitation Programme launched
- 1993. Religious leaders involved: imams addressed at national conference
- 1993 First women appointed as DPHE tubewell mechanics
- 1993: Union Watsan Committees established
- 1994: Media involved in social mobilization exercise: first Sanitation Week
- 1994. Boy Scouts, Girl Guides, Village Defence Party cadres involved
- 1994: Private and public latrine producers top 4,000
- 1995 Communications experts involved. *Meena* cartoon on water and sanitation
- 1995: Bangladesh Standards Institute involved: handpump standards set
- 1995: NGO Forum membership now amounts to 560 partner NGOs
- 1996 School Management Committees take over school latrine construction
- 1996: Users take over all maintenance of No. 6 handpumps
- 1996. All stakeholder groups attend national conference to plan WS future

In turn, UNICEF has itself been faithfully supported by certain key bilateral donors, notably DANIDA and the Swiss Development Corporation (SMC). These partners have acted as stimulators, watch-dogs, colleagues and evaluators. Their insights have helped emphasize such issues as equity in tubewell siting, gender dimensions, and the need for close monitoring and accountability. During the International Water Decade, the World Bank, the United Nations Development Programme (UNDP), and other international agencies began to participate. These agencies are now working on a joint external collaborators' plan.

The growing participation of NGOs in all aspects of water and sanitation is another hallmark of the programme. At an early stage UNICEF recognized the capacity of national NGOs such as BRAC and the Grameen Bank to reach out to thousands of village communities and groups with tubewell loans and sanitation messages. The role of the NGO Forum as the apex body for water and sanitation efforts by smaller NGOs which touch the lives of users and householders endows the programme with a huge extra momentum. NGOs have expanded informal partnerships at thana and union level, as well as contributed to the spread of services.

Because of the demand for facilities stimulated by the water and sanitation programme, the private sector has become an increasingly important partner. Funds have been provided for the training and capitalization of private masons and handymen. Technical assistance has been offered to companies bringing new items onto the market — plastic latrine pans, for example. Such innovations can help reduce prices and make facilities affordable for customers with very low incomes. Promotional partnership with manufacturers of soap is also envisaged.

Another important group of stakeholders are the users of water and sanitation services. So far, efforts to create effective Union Watsan Committees in which they can be properly represented have not been productive. But the example of successful organization of school sanitation by School Management Committees indicates that — when a clear goal is in view — community leaders are more than willing to pull their weight. The annual Sanitation Week provides an opportunity for building new partnerships. Many *thana* development officers and other local officials lend their weight to this process.

Personnel in the Ministries of Health and Education are also allies with great potential as some local campaigns and activities in schools have demonstrated. Their respective spheres of work have an important influence over the spread of knowledge and its impact on behaviour where health is concerned. Disease control programmes — notably that to control diarrhoeal disease — have important overlapping objectives with the drive for clean living. At present, the degree to which district and *thana* health and education personnel lend their support to the sanitation movement varies widely; a more systematic process of linkages at all levels is needed.

A new set of partners which has come onto the scene since the advent of the social mobilization strategy is those professionally involved with mass

The work

communications. The 'Meena' animated video series is only the most prominent way in which allies from the media and the Ministry of Information are helping promote clean living messages throughout the length and breadth of Bangladesh. Cinema shows, microphone vans, folk songs, traditional plays and entertainments are all being deployed. The success of Sanitation Weeks owes much to the participation of these allies.

Although many actors, governmental and NGO, share the credit for the major advances in water supply and sanitation which have taken place in Bangladesh during the past 25 years, UNICEF has continuously played a special facilitating role. It has been an investor and underwriter; a technical innovator; a philosopher and thinker — but one grounded in practical realities; it has helped build up DPHE's capacity and lent support to its changing role; it has acted as catalyser, getting things started and then moving on.

UNICEF remains a linchpin which helps the interlocking parts of the water supply and sanitation movement work smoothly together.

In conclusion: the course ahead

In the 25 years since Bangladesh's independence, a concerted effort has been made to tackle the need, and right, of every Bangladeshi citizen to an accessible supply of clean drinking water. More recently, this effort has been extended to tackle their need — perceived or unperceived — for adequate means of sanitary human waste disposal. But for all these efforts, outstanding challenges still remain.

Diarrhoeal disease still takes a very high toll on the health of Bangladeshi citizens, causing 260,000 young child deaths every year. This clearly means that something more is needed to match the increasing availability of safe water and human waste disposal facilities with a truly effective behavioural revolution. Meeting coverage goals set for the end of the century is one thing. Translating that into fewer young child bouts of illness, parasitic infestations, lower levels of malnutrition, and — ultimately — fewer young child deaths is something else.

But that something should happen and can happen.

If it is possible to effect a major change in drinking habits, it must also be possible to effect changes in other hygiene-related parts of people's lives. In some pockets of the country where intensive hygiene education has accompanied the installation of latrines, observers believe that there is an impact on disease. Villagers notice a difference. They do not feel so threatened by the demon of diarrhoea. Mothers are more sanguine that their children will recover and thrive. The evidence may be anecdotal rather than scientific, but nonetheless local officials and prominent community members are convinced that the message is getting through.

Today, one of the great differences compared to a few years ago is the volume of knowledge available to programme planners about people's attitudes towards water and human waste. This knowledge has sent the water and sanitation movement off in new directions. Assumptions which used to be taken for granted — that few people could be persuaded to purchase or build a sanitary latrine, that the connection of human excreta to disease was self-evident, that owning a latrine was tantamount to using

it — have been discarded. More emphasis is continually being placed on reaching right into the household and community so as to create the consumer demand and bring about the behavioural change that make the difference.

There is no alternative. Despite many grand hydraulic schemes and dreams, there is no way in the foreseeable future that any engineering fix could tidy up and sanitize the great rivers and floodplains of Bangladesh. Equally, it is vain to imagine that people for whom water plays such an integral part in economic, social and cultural life can be persuaded to separate themselves entirely from it. But there are ways in which they can reduce its level of pollution; and there are changes in hand-washing, latrine- and water-use behaviour which would reduce their contact with potential contamination at critical daily-life moments.

It is a common feature of public health campaigns that as the goal becomes closer, the task becomes increasingly complex. With the accumulated experience of the past and present, UNICEF in Bangladesh stands ready to help the sanitation movement master the many complexities which still confront it. The groundwork has been laid. The opportunities are there. The strategy is in place. With renewed commitment and energy, it must be possible to turn the corner towards better environmental health decisively by the end of the century.

Goals for the year 2000

Bangladesh met the goals it set itself in water and sanitation coverage for 1995: **universal access to safe water and access to sanitary excreta disposal for 35% of the population.** The new goal for 2000 is: **access to sanitary excreta disposal for 80% of the population.**

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