

WATSAN India 2000

UNICEF, a Partner with the Government in the Rural Water Supply
and Environmental Sanitation Programme



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United Nations Children's Fund

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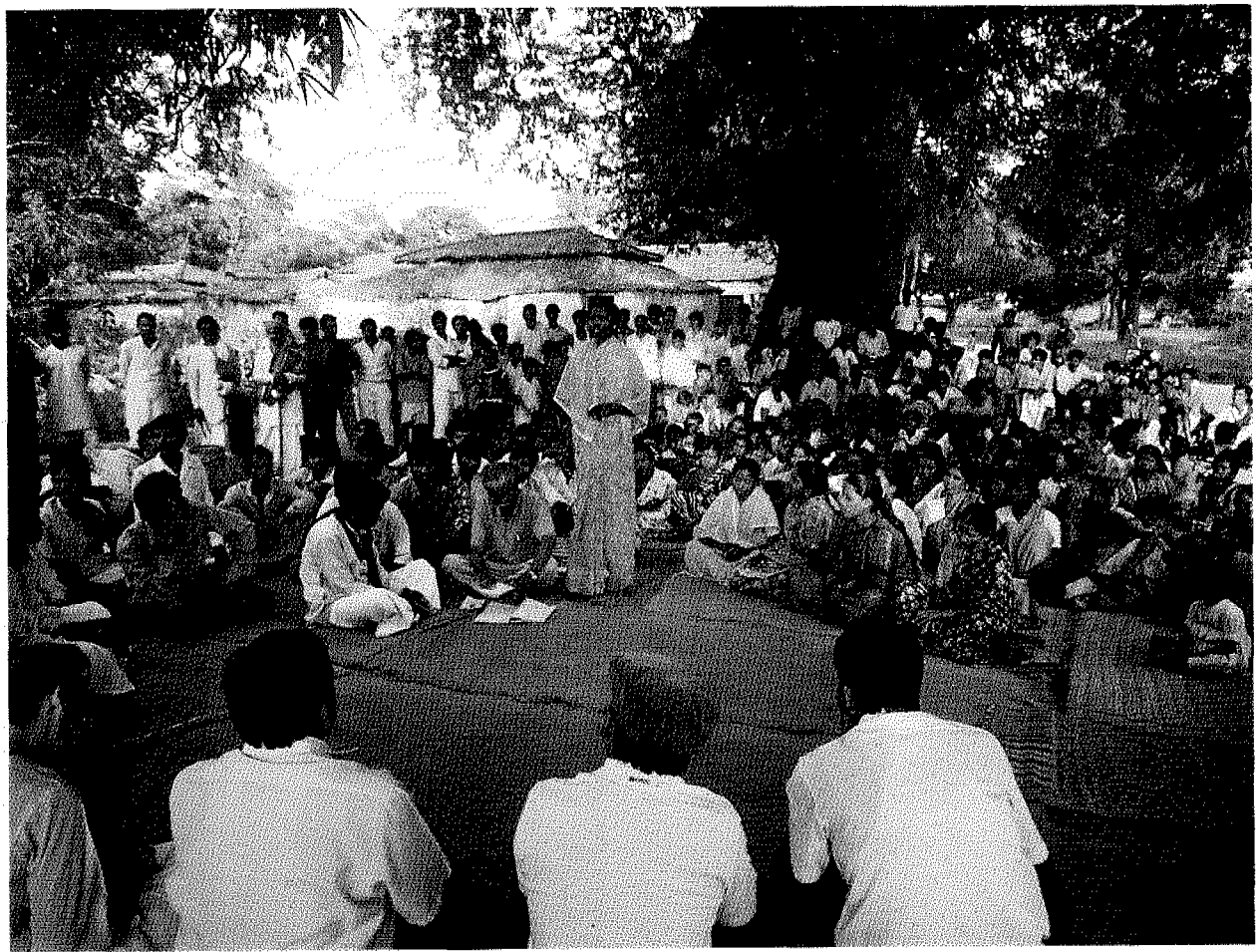
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The Challenge of Community Participation

In India, a million children a year die of diarrhoeal diseases that they develop from drinking unclean water or from living in an unhygienic household environment. Rural Indian women and girls spend up to four hours a day hauling water from remote water sources—time that could be used for better child care or for schooling, time that could be used simply for much-needed rest.

To combat the water-borne diseases that cause so much sickness and death and to relieve the endless drudgery of rural women and girls, the United Nations Children's Fund (UNICEF) has been working with the Government of India since 1966 to provide safe water to the country's rural areas. Since 1985 UNICEF has also actively supported government efforts to improve sanitation in the rural areas.

These years of experience have shown that providing clean water and sanitation facilities is not always an easy task. There are the technical problems of drilling through the hard rock that underlies much of India's rural terrain and the demanding maintenance and repair of handpumps used on the boreholes. There is the necessity to develop a range of appropriate sanitation technology to match the diverse requirements countrywide. There is the urgency to address environmental concerns, as groundwater supplies are over-exploited and polluted. And there are the daunting numbers of people in need of safe water and sanitation in the second most populous country in the world.

Perhaps most difficult of all is developing "hygiene awareness"—helping people to become aware of the relationship between safe water, sanitation and health and to change their

behaviour accordingly. Experience in India and all over the developing world has shown that without participation in the planning, implementation and maintenance of water and sanitation systems by the people who fetch the water and use the facilities provided—by women, in particular—there is very little progress in generating awareness. One of the greatest challenges facing the programme, therefore, is securing women's involvement in it.

The need to involve communities in the programme has been recognized for some time, and it has now become a central feature of the programme itself. This booklet describes the evolution of UNICEF participation in the world's largest rural water supply and environmental sanitation programme—from an early concentration on drilling and handpump "hardware" to an unfolding focus on the community's needs: what UNICEF has contributed as a partner with the Government of India, and the challenges it faces leading up to the year 2000.



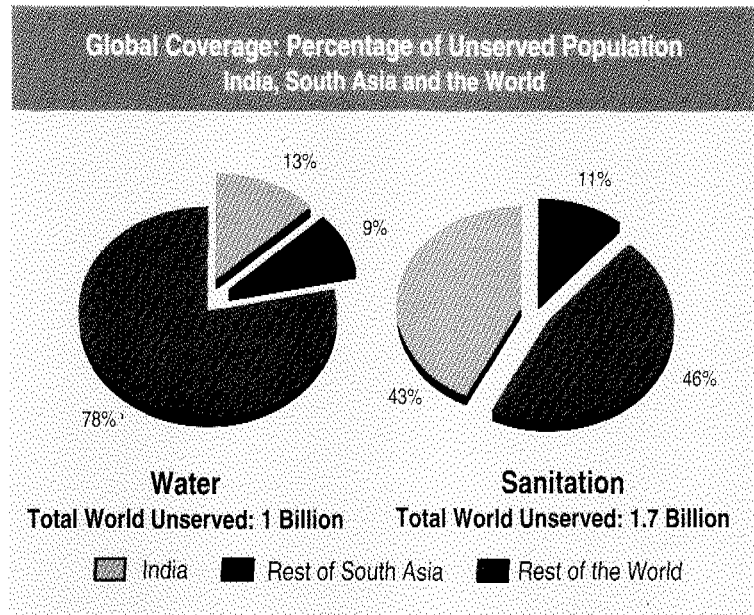
UNICEF WATSAN in India



India in the Global Context

India has one of the highest coverage figures for rural water supply in the South Asia region, which includes Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka. However, because of its huge population, the absolute number of unserved people in India is so large that it accounts for 60 per cent of the total unserved people in the region.

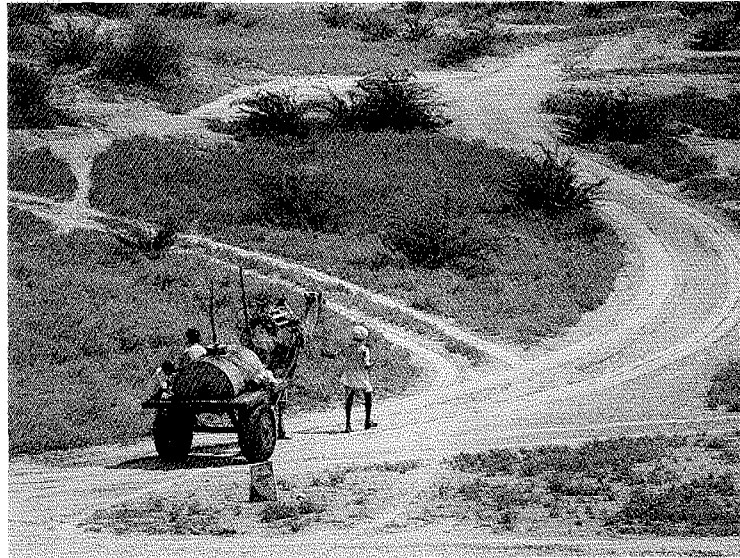
The situation is even more marked for rural sanitation: India's unserved population is 78 per cent of the regional total. Worldwide, India's unserved population for water supply is 13 per cent of the global total and it represents an enormous 43 per cent of the global unserved population for sanitation.



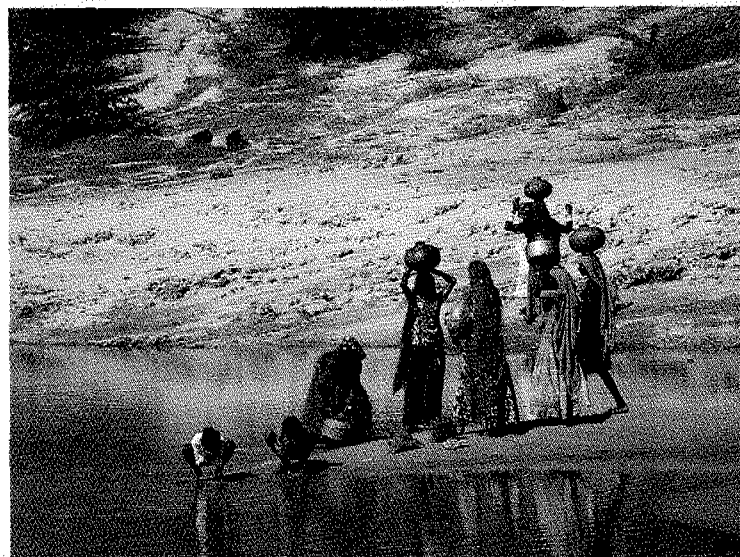
Rural Water Supply

Where is the Water?

Groundwater is not readily available in most of India due to the hard rock shield that covers 70 per cent of the country. In the north, below the Himalayas, three large rivers—the Indus, the Ganges and the Brahmaputra—supply a vast alluvial plain with an abundance of water. But the central and southern part of the country consists of a peninsular slab where surface water is scarce or seasonal and the groundwater is deep and difficult to reach.



Camel carts are widely used to distribute water, for a fee, in Rajasthan.



In desert areas, naris that fill up during the rainy season are an accessible but unsafe source of water.



Is There Enough Water?

Groundwater levels are decreasing worldwide. Deforestation and the resulting soil erosion also hamper the recharging of groundwater. In India, groundwater levels are further affected in drought-prone areas and in places where there has been overpumping for agricultural or industrial needs, or where there are just too many people using the available water. Although many states are affected, there is serious groundwater depletion in Gujarat, Rajasthan, Uttar Pradesh, Andhra Pradesh and Madhya Pradesh.

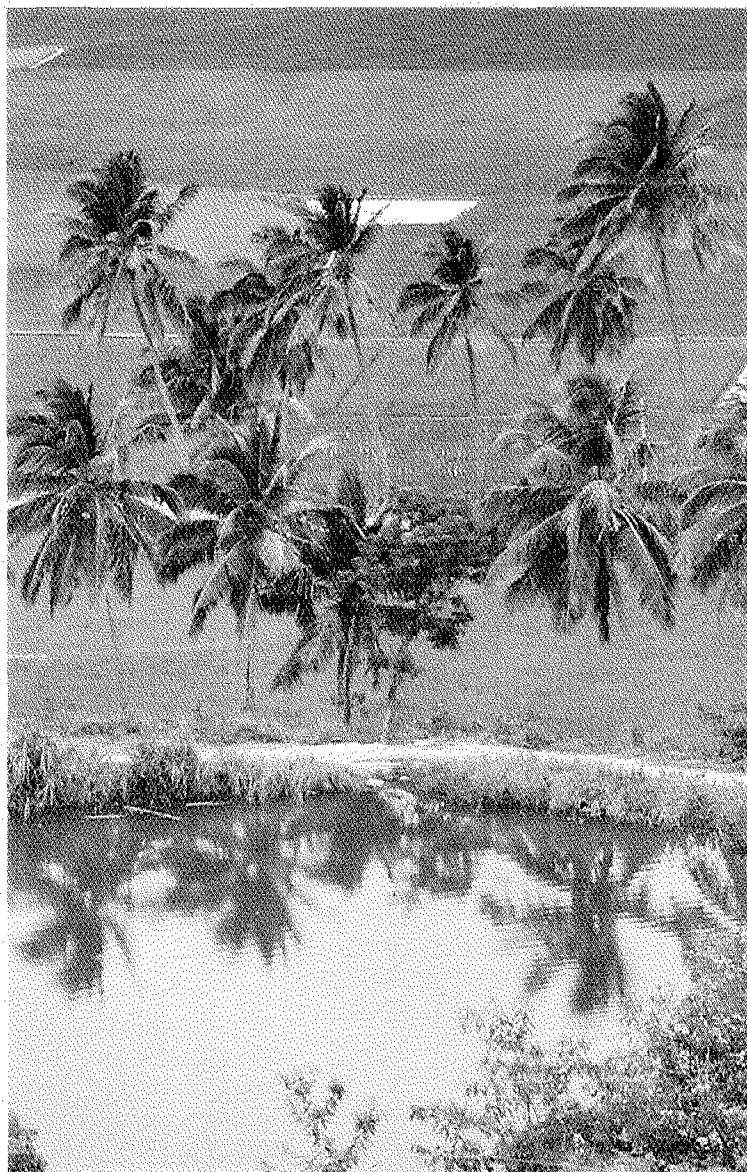


What are the Main Sources of Drinking Water?

A 1992 study conducted in 15 districts where UNICEF is active showed that the handpump and borewell had recently become the primary source of drinking water, used by 42 per cent of the population. The traditional open well served about 27 per cent and 5 per cent of people still collected their drinking water from exposed sources such as rivers, lakes and ponds. In many parts of the country, however, an open well is still the main source of water.



SALIM PAUL, ROYAL NETHERLANDS EMBASSY



Flowing water looks clean, but often it is not (Karnataka).

Most people know they should not drink pond water, but they use it for bathing themselves and watering and washing their animals (Tamil Nadu).

A natural spring is a common source of drinking water in hilly parts of India (coastal Kerala).



SALIM PAUL, ROYAL NETHERLANDS EMBASSY

Who Collects the Water?

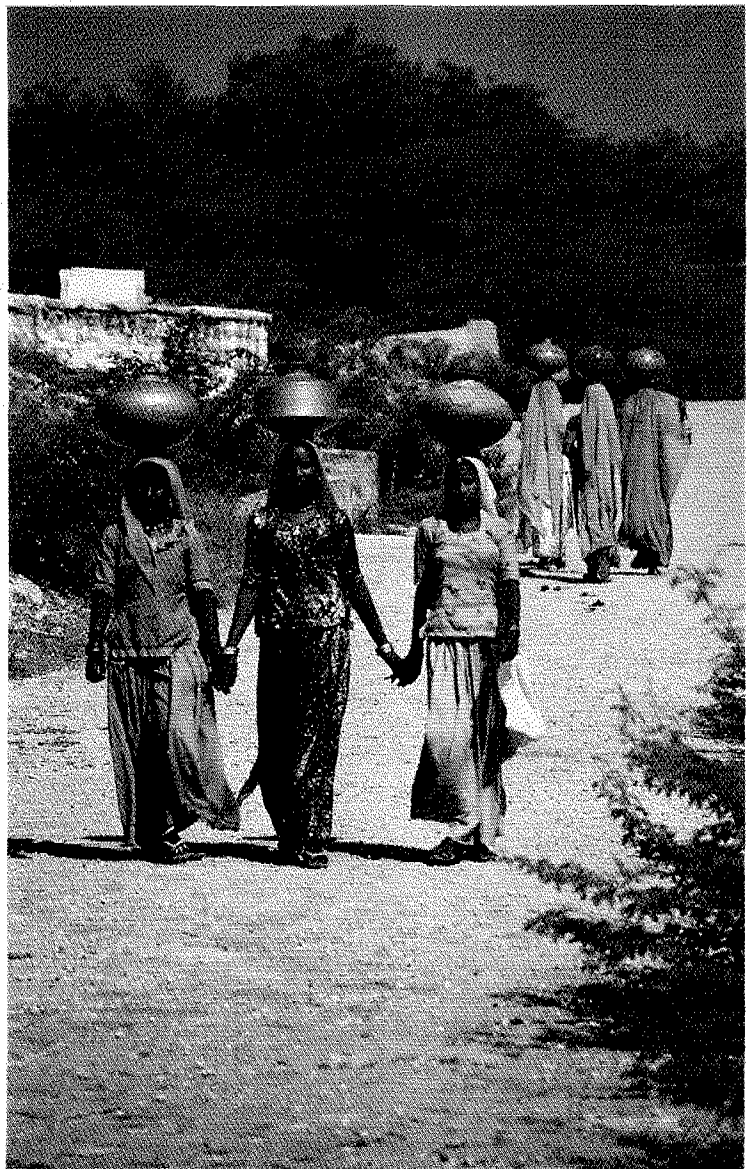
As in most developing countries, in India it is women who are responsible for collecting water and managing its household use. A 1989 Knowledge, Attitudes and Practices (KAP) study showed that women in rural India spent between one and four hours a day collecting water. They made an average of nine trips to a water source, collecting 192 litres of water for an average six-member household, or 32 litres per person per day.



Who is Most Affected by Lack of Water?

It is no surprise that those who have the least access to safe water supplies are also the poorest—the people living in urban slums and in the remote rural areas.

Carrying water is hard physical labour and its impact on the health of girls and women is well documented. A Nepal study found that a reduction of three hours' work fetching water resulted in a saving of 350 kilo calories. Bringing water sources closer, therefore, has important nutritional and other health benefits, especially for the poorest people, who are also most likely to be malnourished or susceptible to illness.



Women's sense of community and solidarity is a source of strength that is beginning to be tapped.

Women Cross Canal for Safe Water

Living at a distance from the water source is not the only problem rural women face. For women in Kadambari village in Medinipur district of West Bengal, the closest handpump is 1.5 km away, which is within the government guidelines, but it is on the other side of a canal. There is a bridge they can use, but to get to it, they must first pass through a marketplace, where they become the object of interest to large numbers of people, including many men who are quick to comment on them as they go by, straining under the weight of one or two water pots.

So the women cross the canal every day instead. During the monsoon, the canal is so deep that they have to swim across, their water vessels in front of them. The banks of the river are often covered with faeces, making the task even more unpleasant and more unsafe.

"It's so hard crossing the canal to get clean water that we often use the canal water itself for bathing and cooking," admits Saibalini Bera. Ms. Bera was the spokesperson for a group of 10 women who successfully made a demand for a handpump on their side of the canal.



Drilling for Water

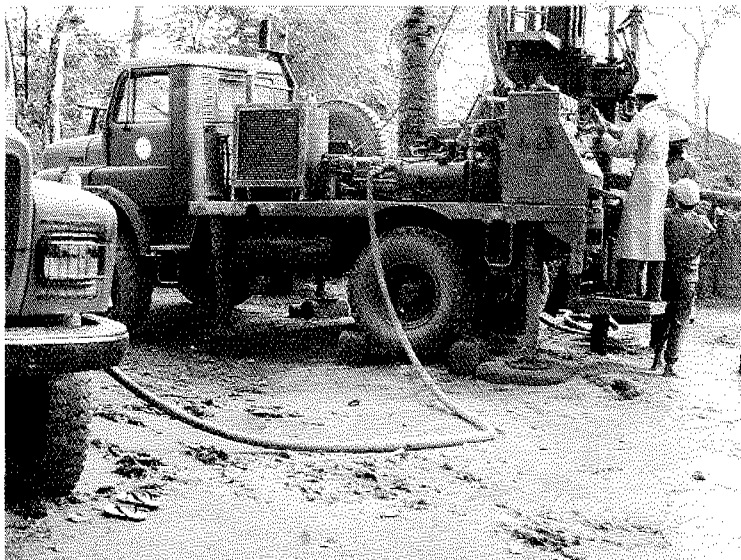
UNICEF Responds to Drought

A drought in the northern states of Bihar and Uttar Pradesh in 1966 brought UNICEF quickly into the rural water supply programme. Building on the contribution of some pioneering NGOs, UNICEF imported 11 "down-the-hole" hammer pneumatic drilling rigs that could drill 30 metres through hard rock, and produce a borehole in eight hours. This was a huge improvement on the several weeks it took to complete a borehole with the percussion cable-tool rigs that were being used in India at the time.

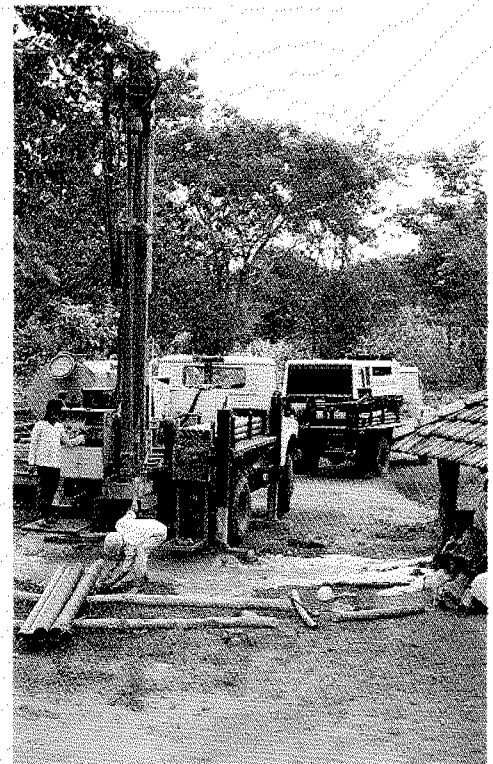
In just a few months, 250 villages whose inhabitants would otherwise have been forced to migrate had drinking water.



Tribal dancers celebrate the arrival of a drilling crew in a district in Orissa.



An indigenous drilling industry has grown up, which now exports rigs for use in other developing countries.



UNICEF introduced a two-truck rig-carrying arrangement that has greatly aided travel to outlying villages.

Reaching the Unreached

In 1969, the Government of India approached UNICEF to help provide safe drinking water to “problem villages”—about one-third of India’s 576,000 villages located in areas where it was difficult to dig or drill for water. Hard-rock drilling thereby entered India on a large scale and established a central role for UNICEF in the country’s rural water supply programme.

As the effectiveness of the new drilling rigs became evident, more were ordered, bringing to 138 the number of UNICEF rigs by 1974. In 1979, UNICEF introduced more versatile, hydraulically powered rigs that improved the quality and increased the production of wells, and in 1983, smaller versions of these rigs were developed by UNICEF in partnership with local manufacturers. This “new generation” of rigs is now the mainstay of the programme.

Since 1989, all the drilling rigs used in the drinking water supply programme have been indigenously produced. For this reason, UNICEF is phasing out its assistance for the purchase of drilling rigs.

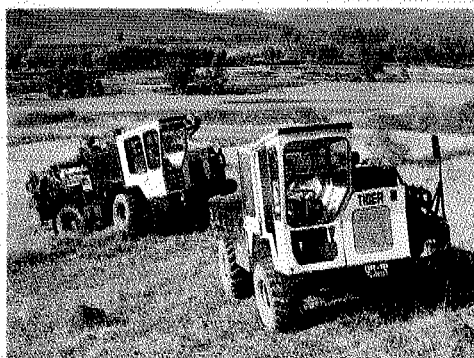
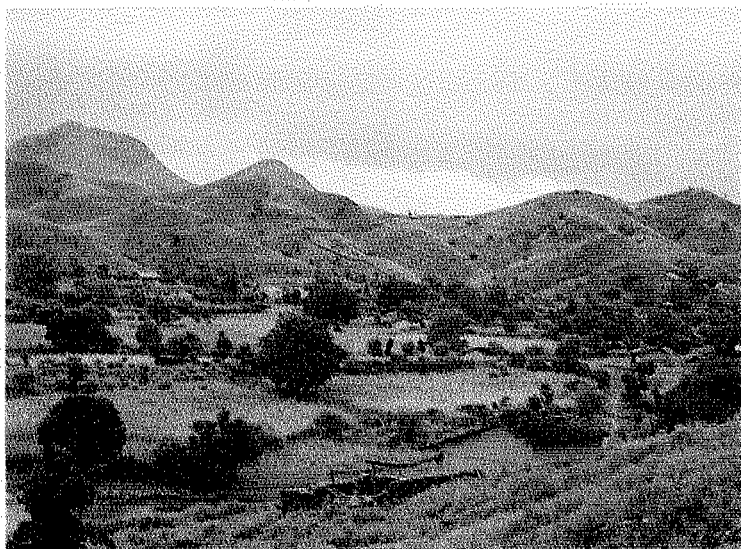


This all-terrain drilling rig can travel to villages that do not have roads.

UNICEF as Trouble Shooter

The evolving UNICEF role in the Indian government’s drilling programme has been to focus on problem areas, including remote villages and difficult geological conditions. In many cases, UNICEF has adapted technological advances from other areas (e.g., oil drilling) in order to solve the problem.

UNICEF also encourages the drilling of high-quality wells. With computerized monitoring, the UNICEF-supported drilling operation promotes optimum use of the rigs, allowing it to be used as a model for the government. UNICEF also procures imported spare parts if necessary and provides training programmes for drilling crews.



Deciding Where to Dig or Drill

Social Mapping

Local women usually have the best knowledge of the water sources in their communities—not just where they are located but how reliable they have been over the years. They know who lives where in their village and what the community's practices and preferences are: how people use their water and how they dispose of their wastes.

This crucial knowledge was sometimes ignored in the early days of the programme and often meant that new government-developed water sources or latrines were not used. Now, in UNICEF-supported projects, local women and village water and sanitation (WATSAN) committees help decide the best location for a new water source.

Scientific Mapping

In the 1970s, geophysical mapping techniques were limited and depended on the analysis of existing open wells and the use of rather complicated mathematical tables to determine drilling sites.

Since then, the picture has changed dramatically: modern computers have simplified the mapping process and bi-weekly data for locating fractures in the rock are now available from India's own satellite photos.

The UNICEF role on the geophysical side of the programme has been to advocate for scientific source-finding techniques and to assist state governments by providing hardware and training in the use of equipment, interpretation of data, report keeping and creation of a computer data base.

The combination of social and scientific mapping techniques are still not foolproof, but every improvement on the



successful drilling rate of 86 per cent countrywide saves time and money. It is likely that with increased community involvement in the location of water sources and new geophysical technique developments, this rate will continue to improve.

Women in rural Delhi assess their WATSAN needs through a participatory rural appraisal exercise.

Hydrofracturing

About 14 per cent of boreholes drilled are unsuccessful: either there is no fracture zone in the rock for the water to gather in or there is no water in the existing fracture. In 1990, UNICEF introduced a new technique called "hydrofracturing"—a way of enlarging a fracture or creating a new one by injecting potable water into a borehole at very high pressure. This increases the well's inflow rate—and it costs just one-third the price of a new borehole.

UNICEF has supplied 22 hydrofracturing units to the government and is promoting their production in India. Once manufacture is locally based, the expected lower price will allow government and private contractors to use the method more widely.



When Will the Drilling End?

In 1994, as many as 200,000 “habitations” (clusters of houses) in India still did not have any safe source of water. This was due not just to the drying up of old wells, which the new hydrofracturing programme is only beginning to address, and to problems of water quality in existing wells, but to population growth of 2.1 per cent per year.

In addition, when the government makes the expected countrywide change in water supply norms (see below), more boreholes will be necessary. These norms are already being used in some UNICEF-assisted projects such as Ranchi district in Bihar. It is clear, therefore, that the government drilling programme will be needed for some time to come.

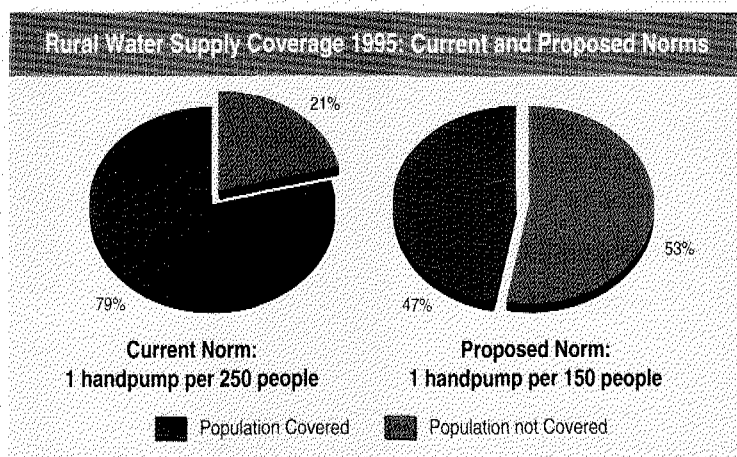
Changing Water Supply Norms

The current definition of access to safe water specifies that a handpump serve a maximum of 250 people, that it be no further away than 1.6 kilometres on the plains or 100 metres’ elevation in hilly

terrain, and that it be capable of supplying 40 litres of water per person per day (or 70 litres in arid areas, with the additional quantity for livestock).

The proposed definition is that it serve a maximum of only 150 people, at a maximum distance of just 1 kilometre on the plains or 50 metres’ elevation in hilly terrain, and that it supply the same amount of water, 40 litres per person per day.

India's population is growing at the rate of 2.1 per cent per year.



Source: WCD

An Indian Success Story

In 1974, UNICEF carried out a spot survey of the handpumps installed in Tamil Nadu and Maharashtra and made the startling discovery that only 25 per cent of them were working. This meant that three-quarters of the 9,000 villages that had been supplied with boreholes and

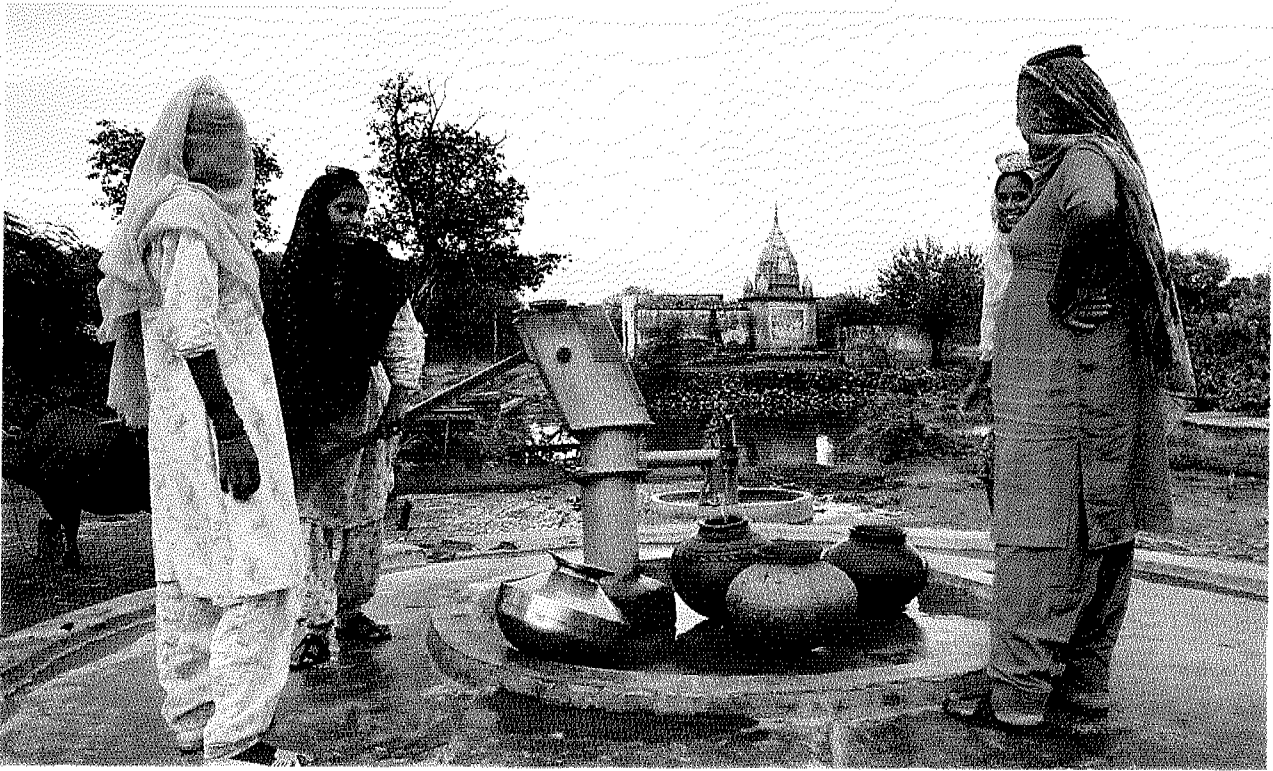
pumps were having to resort to their traditional—mostly unsafe—water supplies.

One problem was maintenance and repair, which was a government responsibility, in cooperation with the village panchayats and their *mistris* or handy-men. Yet there was no system of providing tools and spare parts to the *mistris* nor had there been any training programmes.

Another problem was that the pumps were copies of old-fashioned North American and European models made of cast iron and designed for single-family use. How could they be expected to stand up to use by a whole Indian village?

India's gift to the developing world, the India Mark III handpump.





Designing a Handpump

By 1975, thanks to the work of several NGOs, a number of advances were being made in pump design. UNICEF studied these and decided to adopt the Sholapur pump. Made by Sholapur Well Service, a Maharashtra-based NGO, it proved to be the perfect interim solution to the handpump breakdown problem. UNICEF, in collaboration with a Government of India research and development organization and a manufacturing undertaking, continued to develop the design.

The requirements were many: the pump had to be sturdy enough to last a year without repair (some of the early models broke down the day they were installed!) and easy to maintain. It had to have standardized components and be produced on a mass scale in Indian factories, with locally available materials. And because of the enormous number of pumps needed, it had to be cheap.

With all these requirements in mind, a new Indian-designed and manufactured handpump was born.

The India Mark II

What became known as the India Mark II in effect made maintenance possible—and by 1977, its success was beginning to be felt. However, many versions of the pump began to appear as manufacturers rushed to exploit the new design. UNICEF pushed hard for quality control and in 1980, the specifications for manufacture of the pump were issued by the Indian Standards Institute (now the Bureau of Indian Standards). The government agreed to let private agencies inspect manufacturers' pumps and UNICEF maintained a list of qualified manufacturers to ensure quality control and interchangeable components and spare parts.

In 1993, UNICEF took a significant step towards capacity building by handing over its role of ensuring handpump quality control through private agencies to the Bureau of Indian Standards.

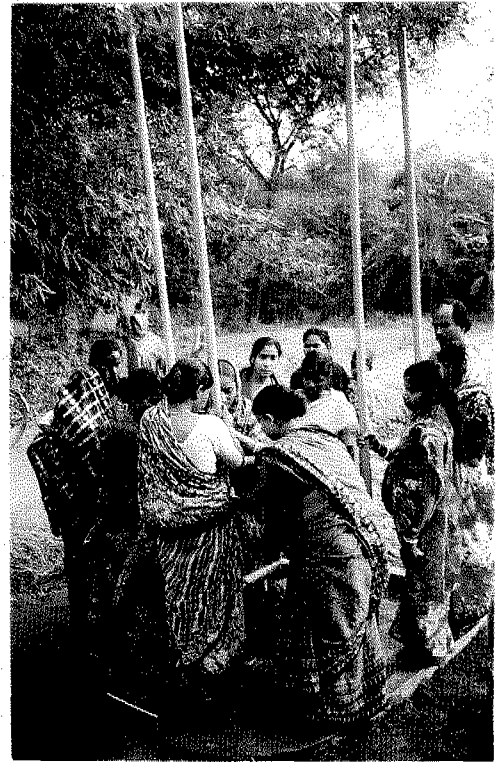
By 1994, 2.5 million India Mark IIs were in place in rural India—and the world's best-known handpump was being exported to 40 countries.



The Tara is the optimum pump for alluvial areas (Bihar).

A woman mechanic and caretaker repair an India Mark III in Ranchi district, Bihar.

All of the 3,000 Tara pumps in West Bengal are maintained by women caretakers/mechanics.



Village-Friendly Pumps

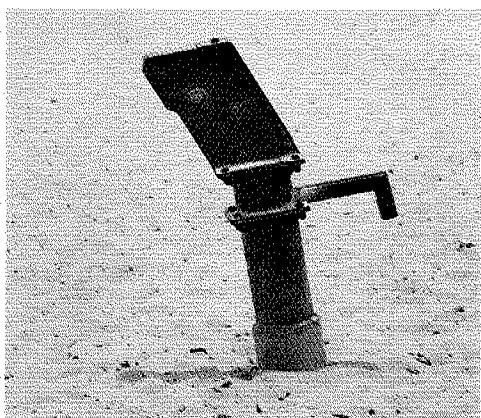
In spite of the success of the India Mark II, it was clear that a more village-friendly pump—or as it is commonly called, a “village-level operation and maintenance” (VLOM) pump—was needed. In 1987, the new-generation India Mark III was born and introduced.

Three years later, another VLOM pump, the Tara, from Bangladesh, was adapted for use in India’s alluvial areas, which have higher water tables. The Tara has easily removable plastic rods and its tool kit consists of just two spanners.

The VLOM pumps are not just easier but cheaper to maintain. Aside from the fact that the government does not have the capacity to handle the maintenance of millions of pumps, repair is less costly and more rapid at village level. And the whole maintenance and repair process is more likely to keep going, to be sustainable, when it is managed by the community itself.

Community Handpump Maintenance

Even very sturdy handpumps like the India Mark II and Mark III break down. To help solve the maintenance problem, UNICEF developed the concept of the “handpump caretaker,” a person to act as a link between village pump users and block level authorities. This was a very important first step on the way to community participation in the rural water supply programme—it was also the point at which women began to be brought actively into the programme.



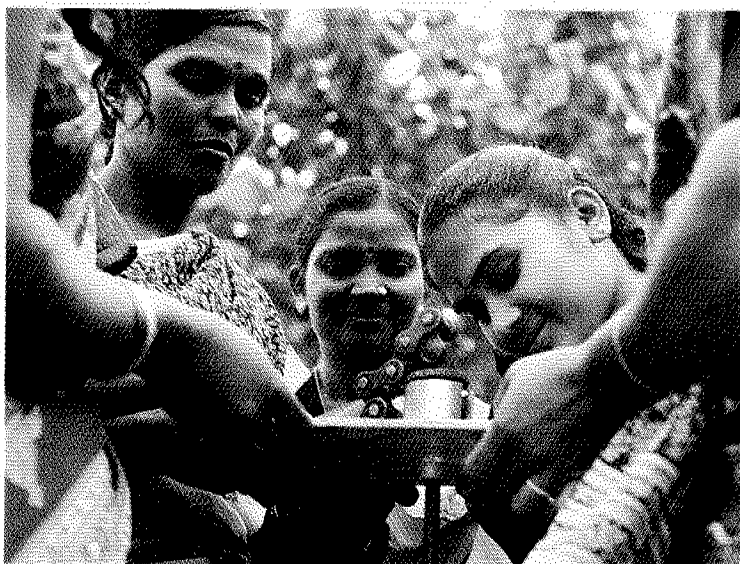
The answer to this problem: community-based maintenance.

A three-tier maintenance system introduced in 1976 is still in use in many parts of the country today. It consists of a mobile repair team (a truck with a mechanic and helpers) at district level, responsible for 500 pumps; a trained mechanic at block level, responsible for 100 pumps; and a handpump caretaker at village level, responsible for one pump.

In 1984, UNICEF commissioned another survey on the use and condition of handpumps in six states. Things were looking up: this time 80 per cent of the handpumps were in operation—almost the reverse of the 1974 survey. The bad news, however, was that this seemed to be due more to the hardness of the pump than to effective maintenance.

UNICEF assisted an NGO in devising an alternate system. The idea to train local people as village pump mechanics and equip them with proper tools and spare parts was first tried out by an NGO based in Tilonia in Rajasthan. Since then, the training of village pump mechanics has continued in 12 states.

Women’s involvement in handpump maintenance was also tested first in Rajasthan, in Banswara district in 1988. It was a radical strategy to consider training illiterate rural women who were still part of a male-dominated, almost feudal society. But the idea that it was in the women’s interests, as chief managers and users of water, to take on the job, was a sound one. The project was immediately successful and was replicated in other areas, highlighting once again the crucial role of NGOs and the effectiveness of close interaction between government, UNICEF and voluntary agencies.



Since the late 1980s 2,500 women have been trained as village handpump mechanics and 20,000 as handpump caretakers.

New Skills—and New Solidarity

It was easy for us in some ways, because we saw that women from Dungarpur and Banswara had learned to be handpump mechanics. So we knew we could do it too.

Narayni, Rasila, Shambhu, Mira and Lakshmi are from neighbouring villages in Udaipur district in Rajasthan. Its mainly tribal inhabitants have traditionally used the stepwell as a water source and during the dry season, it suffers from a number of water-borne diseases, including guineaworm.

Udaipur district was the third to be targeted by the UNICEF-assisted Sanitation, Water and Community Health (SWACH) project in Rajasthan; in 1991, the five women were trained to maintain and repair some of the India Mark II handpumps that had been installed to provide safe water in their area. They've been working alone or in twos and threes, maintaining about 60 handpumps, ever since. Grey uniforms covering their brightly coloured saris, they check each handpump every two weeks. Five or six times a month they are called on to fix broken-down handpumps. This adds up to about two full days of work a week, for which they are paid a small salary, the first most of them have ever had.

"People used to laugh at us in the beginning," Shambhu says, and the others nod. The women like to speak as a part of a group,

because that's how they see themselves. "They didn't think we could do what they said was a man's job."

After all, taking out the pump's assembly requires a lot of strength. And the toolbox itself weighs 15 kilograms! If necessary, the women ask their husbands to help with the heavy lifting, and the villagers who advise them of a pump breakdown usually help to carry the toolbox, often several kilometres over hilly, rocky terrain.

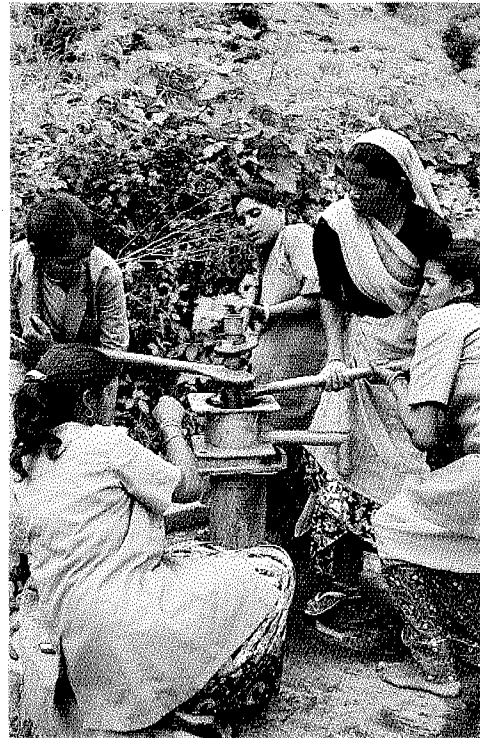
"Now the villagers praise us for helping them to have safe water."

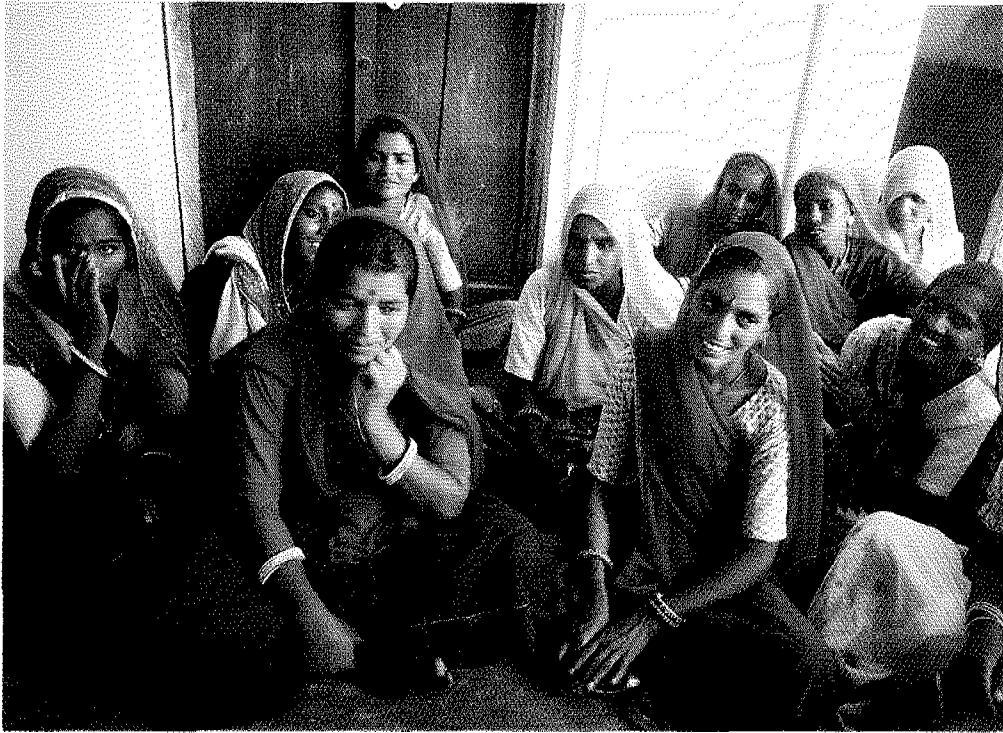
All agree that their status in their families has improved since they began working on the pumps. Their salaries have allowed them to have savings accounts for the first time, and to purchase new cooking utensils and clothing.

Rasila is the only one who can read and write. (During their training the women used songs to help remember the names of the handpump tools and spare parts.) Now, Rasila is

working with three of the others once a week in her home, to teach them basic literacy.

As the women themselves attest, one of the most beneficial aspects of their training has been the opportunity to learn and work with each other.





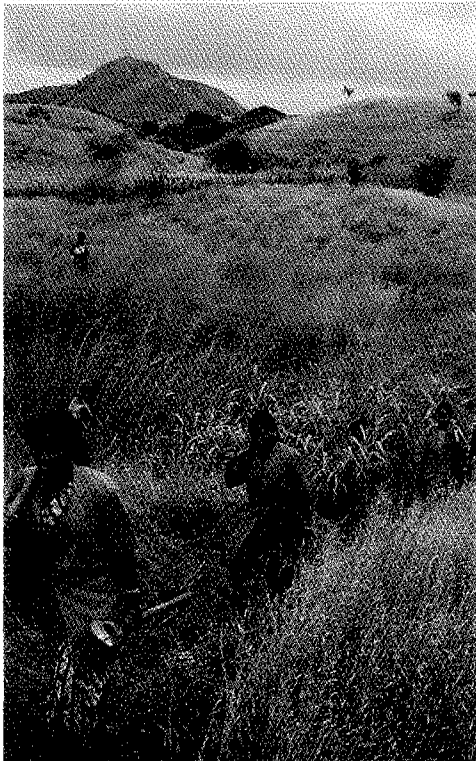
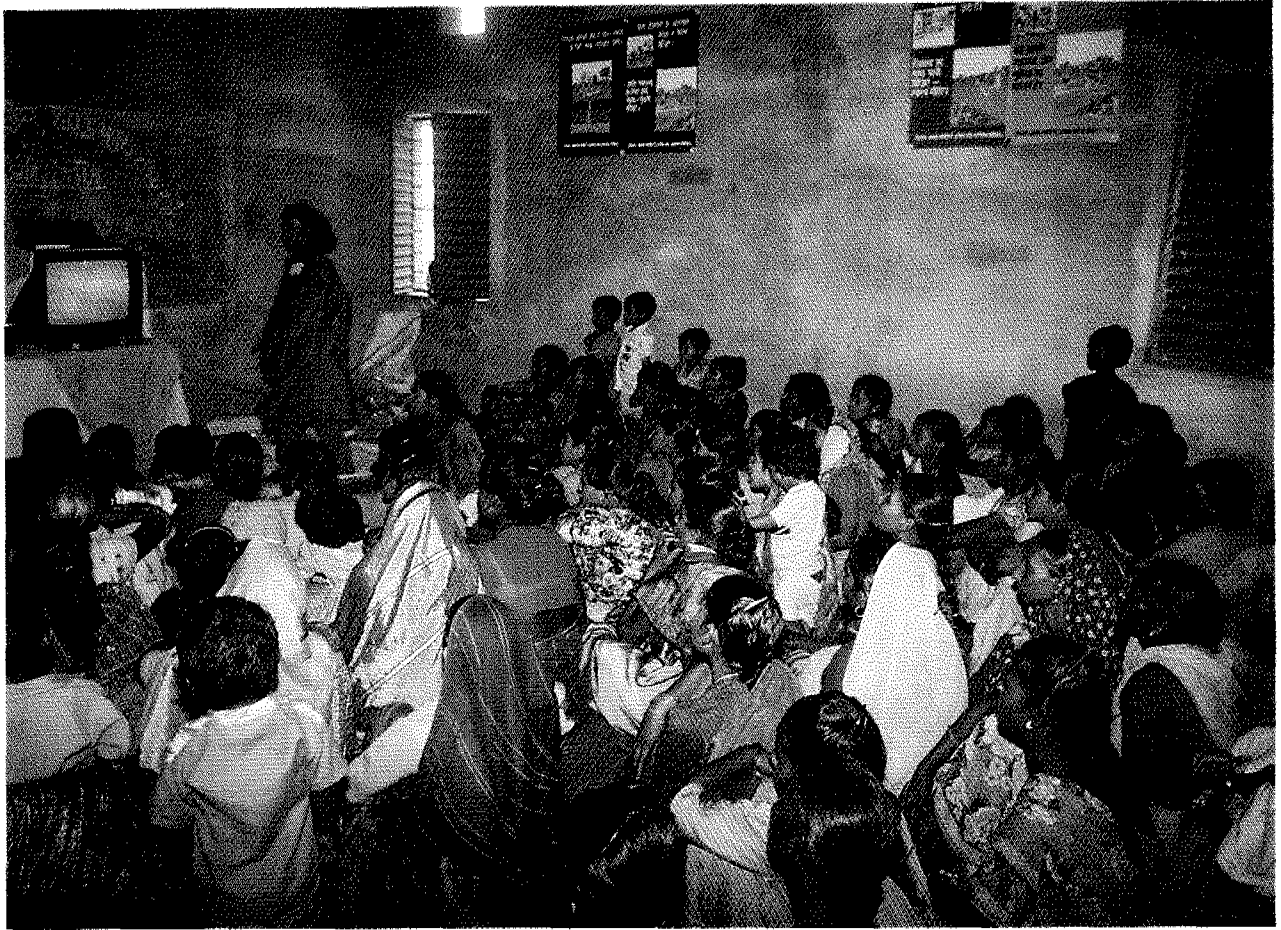
Enhancing Women's Lives

Now, several years into the community handpump maintenance programme, a number of concerns have surfaced. Perhaps surprisingly, there is less and less resistance to the idea of women being trained as mechanics: the need for a supplement to the family's income overrides most opposition. But in some areas, especially where the people are landless labourers (e.g., parts of Rajasthan), there is a demand by men that they be trained as well. In addition, the



women in many areas are not content with a part-time mechanic's job and would prefer to be responsible for more handpumps in order to gain a better salary. (A notable precedent is the cooperative of women mechanics formed in Banda district of Uttar Pradesh, whose members are contracted by the UP government to do handpump maintenance and repair in the state.) Some women have demanded literacy training as part of the mechanic's training, pointing out that they cannot do their job well without being able to read and write.

It is clear from this experience that the job of pump mechanic must not be seen as one more task for women to take on in their role as water managers—which just adds to their burden. Rather it must be a way to allow women to earn a salary and improve their position in society, significantly enhancing the quality of their lives—which is true empowerment.



Women mechanics sometimes travel long distances with heavy tools.

The Goals: Where We Stand on Water Supply

There has been a steady growth in rural water supply coverage since the goals were set, from 73 per cent in 1990 to 79 per cent in 1995. This, and the Government of India's pledge in late 1994 to accelerate its efforts in water supply, make it probable that India will achieve the goal of universal access by the year 2000.

However, a great deal of work—perhaps even a new programme—is necessary to bring water points closer, reduce the number of users per pump, make more water available per person and sustain the achievement.

Who Uses Latrines?

Only an estimated 14 per cent of India's 113 million rural households have access to latrines. That leaves 97 million rural households that do not have access to them.

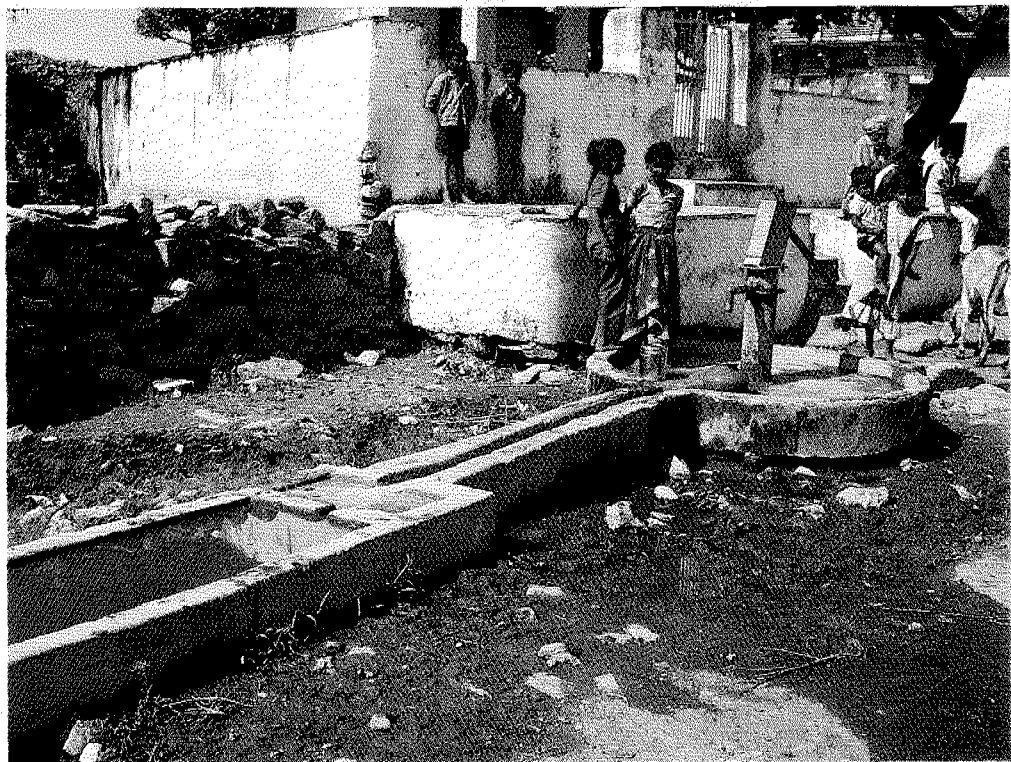


What Happens to Human Waste?

Most people in rural India defecate outdoors, near the village itself or in the fields, on a river bank or on the edge of a road. Some people believe it is more hygienic than using a latrine because excreta is deposited away from their homes.



The majority of people who defecate outside do not cover or dispose of their excreta. This may not be particularly problematic in sparsely populated areas where the excreta dries quickly. But with the expansion of towns into the countryside, these areas are more and more rare. And exposed excreta is a serious problem during the rainy season.



Is There Hygiene Awareness?

The sanitation-health link is weak in people's minds. Some association is perceived between health and personal cleanliness; to a lesser extent between health and household cleanliness; almost none between health and environmental hygiene (1989 KAP Study).

Studies have shown that about two-thirds of the rural population think that exposed excreta is harmful to health, yet less than a quarter understand the faecal-oral danger. Most people think that children's faeces are not harmful, which explains why they are often disposed of close to the household.

Most rural people in India wash their hands after defecating, although about one-quarter wash just with water. About a third of villagers use soap or ash as well as water to wash their hands.

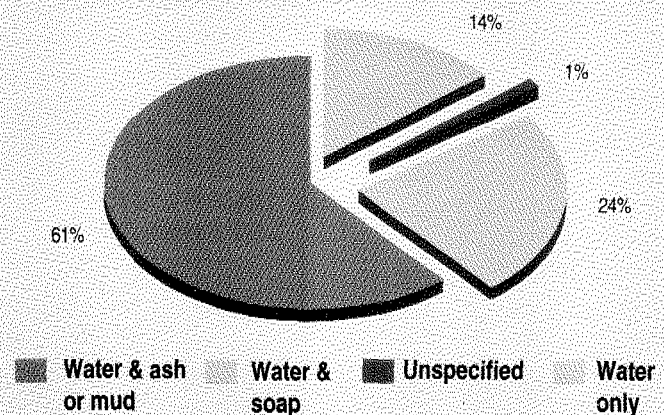
Who Wants a Latrine?

In densely populated rural areas like Uttar Pradesh and West Bengal, the lack of privacy and the need to walk long distances to find a suitable spot to defecate are recognized as a problem. It is also difficult to defecate outdoors during the rainy season or at night. Many people who are sick or old would prefer to have a place closer to their homes.

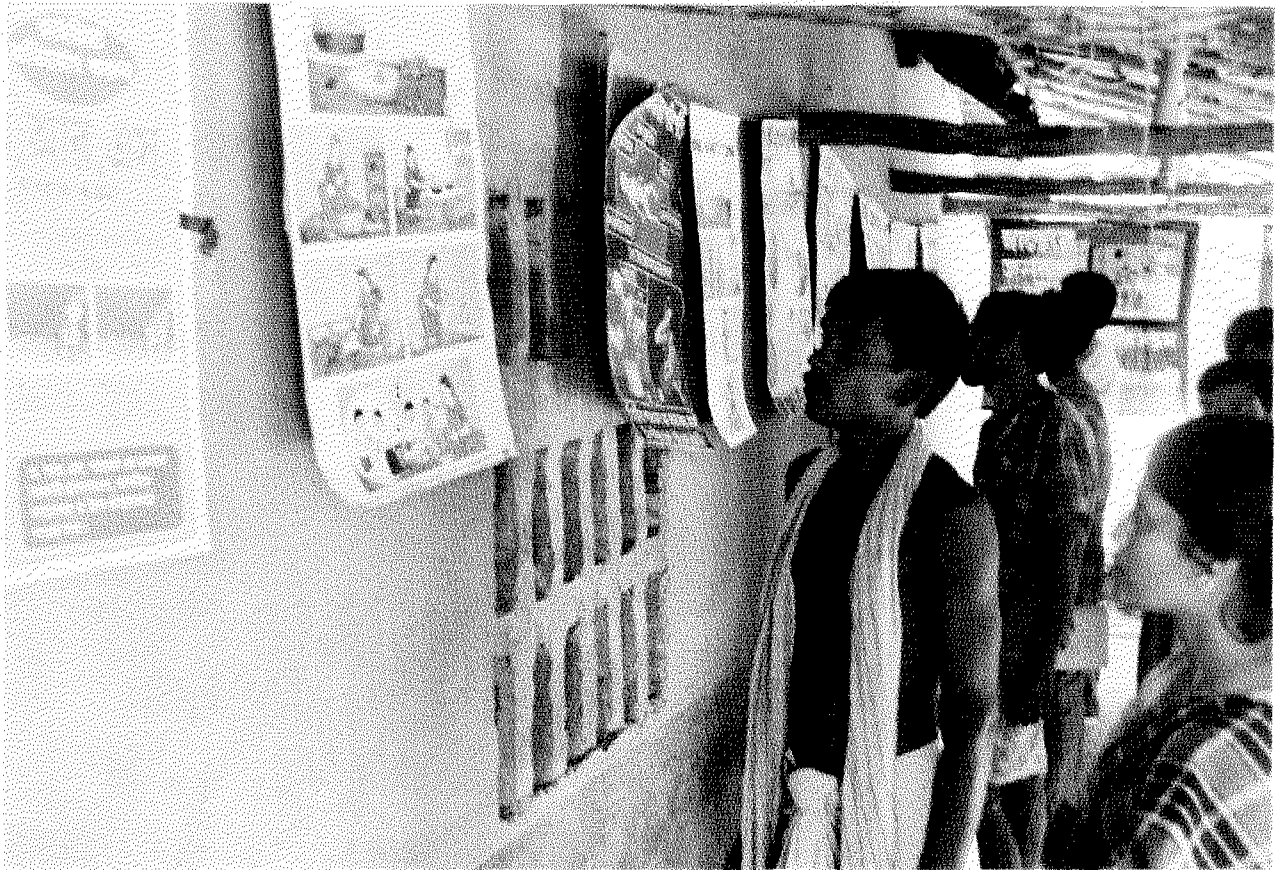
For women everywhere in the rural countryside, privacy is a major consideration. Many women must go early in the morning before it is light or wait till nighttime to urinate or defecate to ensure privacy. Some women avoid drinking during the day, even in the scorching summer months, because they have no place to urinate in privacy. And harassment of women who walk out on their own is sometimes a problem. Waiting to urinate or defecate is not just uncomfortable but can cause serious health problems like urinary tract infections.



How People Wash Their Hands After Defecation



Source: 1989 KAP Study



Towards Hygiene Awareness

It is a commonplace that India's rural sanitation programme has lagged far behind rural water supply. UNICEF has been working in sanitation since late 1982, when it assisted three NGOs in setting up rural sanitation schemes in West Bengal and Orissa. The programme was extended the following year to Andhra Pradesh, Maharashtra, Gujarat and Madhya Pradesh.

Hygiene awareness was an integral part of the programme even then, for it was recognized that it was cheaper and easier to change unsanitary practices—such as allowing garbage, cow dung and stagnant water to collect near a household—than to build a latrine.

As part of this programme, UNICEF produced a number of educational materials on the relationship

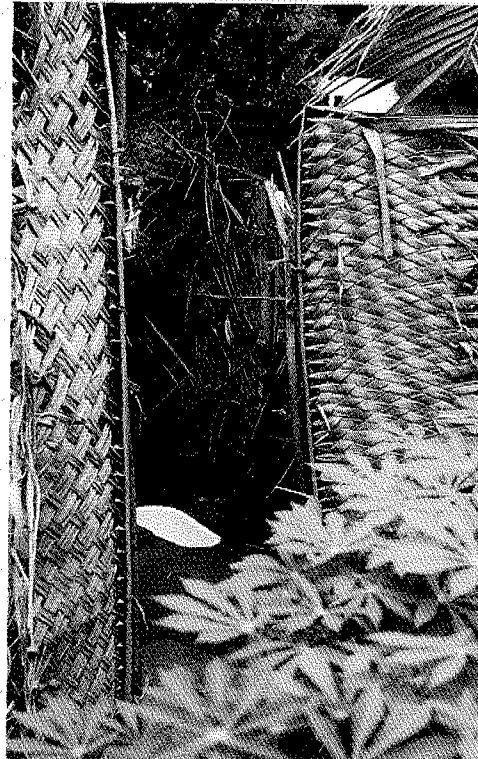
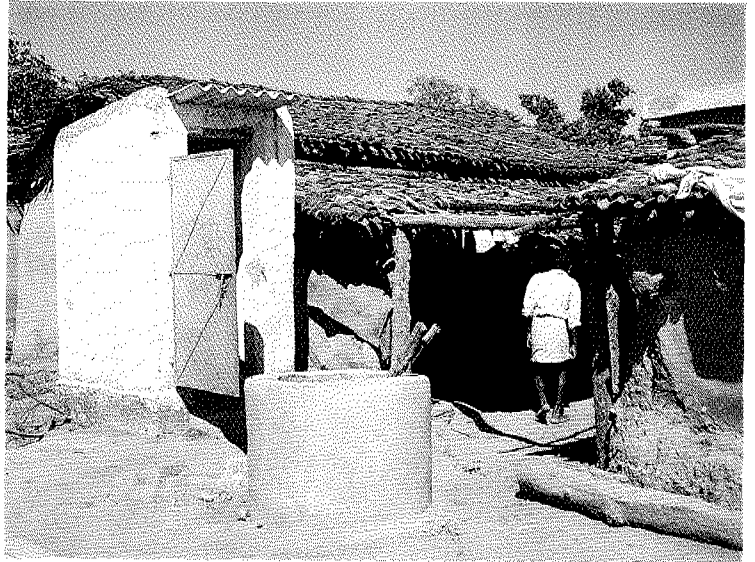
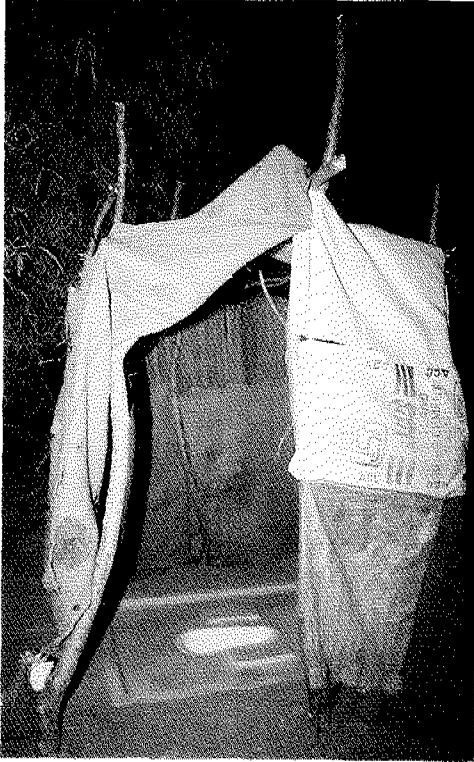
between water, dirt and health for use by health educators, community development officers, teachers and *anganwadi* (mother/child centre) workers.

In 1986, a feasibility study on latrine technology supported by UNICEF indicated that the rural population was eager to use latrines. A low-cost, dual pit, water-seal latrine began to be promoted country-wide. The programme focused on subsidized latrine construction for the poorest people.

By 1990, only 3 per cent of rural households had received a sanitary latrine through the government programme but another 8 per cent had been constructed at people's own expense. This indicated both the demand for latrines and the need for the programme to take a more flexible approach.

Educational posters designed by local artists greet visitors to the village centre.

A wide range of low-cost latrines is available countrywide. Pans and traps are made of cement or fibreglass and the walls and roof vary, depending on local materials and a family's means.



Sanitation as a Package

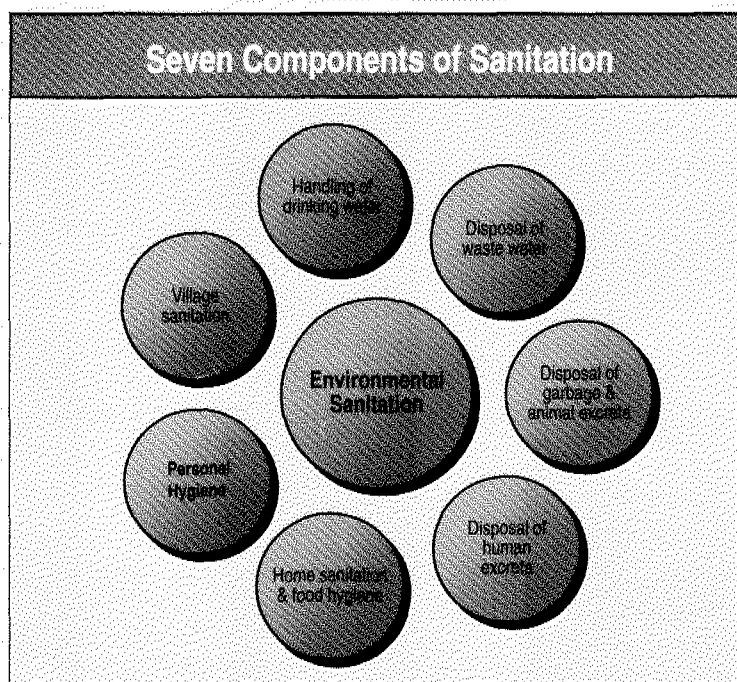
By 1990 it was also clear that the programme should not be concentrating just on latrine construction. Having a latrine does not ensure hygienic practices. In fact, in the early days of the programme, some people provided with latrines were found to be using them to store food or as a shelter for their animals!

Disposal of human excreta is only one component of sanitation, the new government sanitation strategy argued: it must be grouped together with the others to form a total package of sanitation facilities and services (see figure).

Hygiene awareness is probably a much better measure of sanitation coverage than the number of latrines. Once achieved, it creates a demand for other sanitation facilities such as bathing platforms, soakage pits, garbage disposal and smokeless *chulhas* or stoves, as well as for latrines.

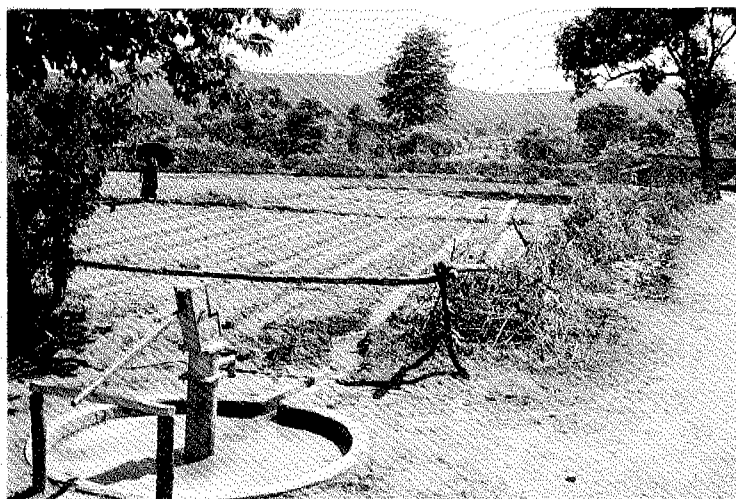
Following a 1992 National Seminar on Rural Sanitation, the government made several policy changes that had been strongly advocated by UNICEF: elimination of subsidies for families above the poverty line, a 10-per cent budget allocation for Information, Education and Communication, more flexibility in the choice of latrine and other sanitation technology, and an agreement to promote non-governmental initiative in the sale and construction of sanitation facilities.

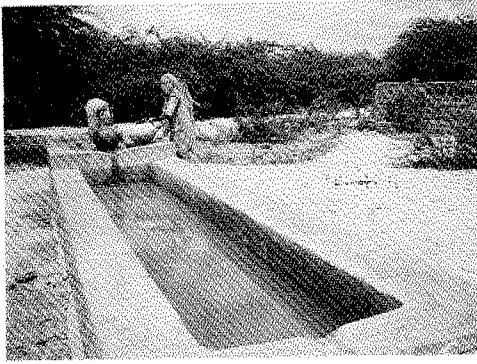
The Central Rural Sanitation Programme (CRSP) promotes sanitation as a seven-component package



A separate washing platform helps to keep the area around the pump clean.

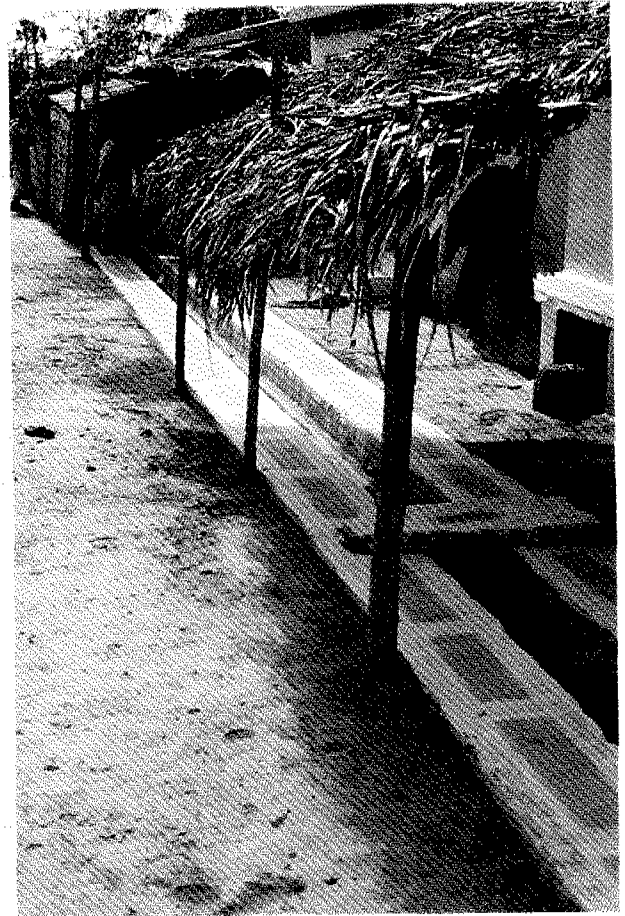
This drain siphons excess water off to irrigate a field in Badri village in Bihar.



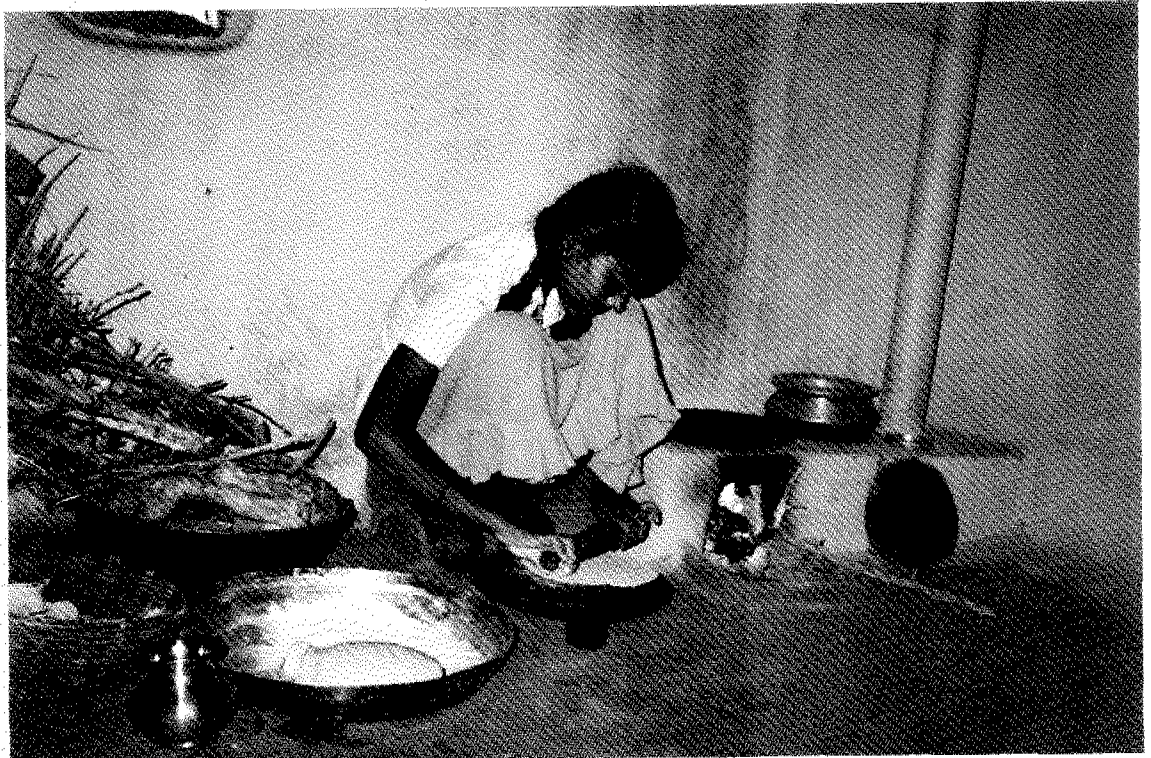


Water from this standpost is diverted to a cattle trough.

Waste water flows into a cement drainage system in this Tamil Nadu village.



A smokeless chulha is a low-cost alternative to the conventional chulha, which is not only dirty, but causes eye irritation and respiratory disease.

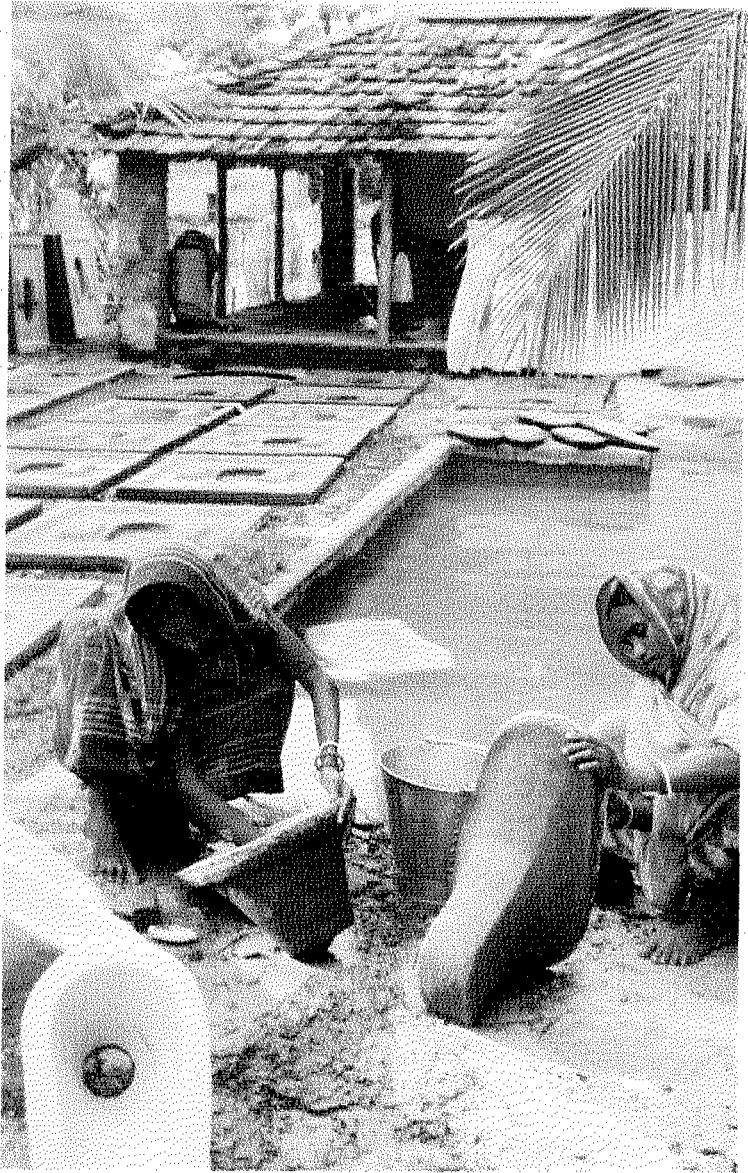


Training Women as Masons

The new environmental sanitation strategies also focus on creating employment opportunities for women. In one ambitious new project, women (and men) are being trained as masons to build latrines. The goal is one mason per panchayat—and there are over 200,000 panchayats in India!



These Tamil Nadu women masons are constructing a ferro-cement rainwater harvesting tank.



Women work in a production centre for latrine parts in Medinipur, West Bengal.



This women's collective in Jaipur, Rajasthan, has formed to make fibreglass latrine pans.

No Weddings in Houses Without Latrines!

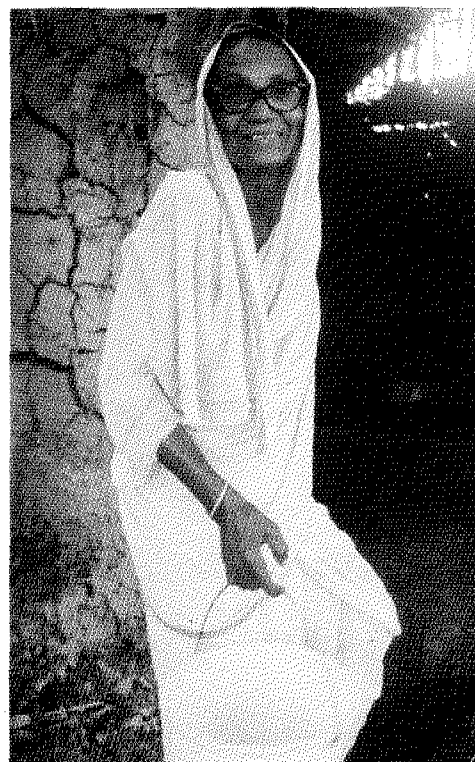
I've been married for more than 30 years, so I don't have any problem going out in the field. But I didn't think my new daughter-in-law should have to go outside. So when my son got married, we bought a latrine.

In her statement to a "mother's meeting" in Nanda village in Hooghly district of West Bengal, Molina Beg demonstrated that although attitudes sometimes change very slowly, they do change.

The meeting was convened by village hygiene awareness motivators to discuss sanitation issues and encourage villagers who had not yet done so to build a latrine. People who have latrines soon become advocates, for not only do they prefer the privacy and cleanliness a latrine provides but they are less tolerant of other people defecating outdoors.

Here and in a number of projects around the country that provide hygiene education and low-cost sanitation facilities, the community is involved in planning and implementation. A notable example is the Intensive Sanitation Project (ISP) launched in neighbouring Medinipur district in 1990 by UNICEF and the NGO, Ramakrishna Mission.

It operates through "cluster" organizations and village clubs that recruit village motivators (usually young people, one for every 200 families) who tirelessly canvass the village people with information, both about hygiene and a range of available latrine options.



The cheapest option is a single pit latrine with mosaic pan and trap and concrete platform, and the household improvises its own cover of thatch, bamboo or plastic. The ISP provides loans to those who need them.

Animators in some villages in Medinipur used the slogan "No Weddings in Houses Without Latrines"—unmarried women took part in a demonstration, declaring they would not marry into a family that did not have a latrine.

These and other strategies apparently worked well: by 1994, 74,000 latrines had been built in the district!



From Nail Clippers to Latrines

In 1991, the innovative "rural sanitary mart" (RSM), promoted by UNICEF, was introduced in Uttar Pradesh. The RSM is a retail outlet offering a "sanitation package"—that is, all the materials required for construction of latrines and other sanitary facilities as well as water jugs, ladles, soap, nail clippers, plastic sandals, clothespins and oral rehydration salts (ORS) packets. The sanitary mart is a commercial enterprise run by a person who can also give detailed information about latrine construction and other aspects of sanitation. Each sanitary mart links up with a group of trained local masons and thus acts as a service centre as well.

By 1994, the idea had taken off and more than a hundred RSMs had been set up in Uttar Pradesh and in Orissa, Maharashtra, West Bengal, Bihar, Rajasthan and Delhi.

A rural sanitary mart offers everything you need for sanitation.

This RSM in Bihar is located next door to a production centre for pans and traps.



Najafgarh Rural Sanitary Mart

In September 1993, Karan Singh, a poor health motivator from the town of Najafgarh, West Delhi, turned entrepreneur. Under the supervision of the NGO, Asha Sadan, and with financial assistance from UNICEF, Mr Singh started a Rural Sanitary Mart.

A one-stop shop equipped with all the materials needed for a basic low-cost sanitary facility, the RSM, in its first eight months, helped over 200 families in Najafgarh and the adjoining villages to build private latrines.

UNICEF contributed funds to stock the required materials. A revolving fund of 600,000 rupees (about US\$19,000), created jointly by UNICEF and Asha Sadan, provides interest-free loans to families who want to construct latrines. The families pay back the loan in monthly instalments.

The effort is backed up by a dedicated group of volunteers who fan out into the countryside each day to introduce the new low-cost sanitation technology and spread awareness of environmental sanitation and personal hygiene.

After receiving an order for the construction of a latrine, Mr Singh takes responsibility for the complete project—from arranging masons to supplying construction materials and sanitary ware. A variety of low-cost latrines are available, ranging in cost from 500 rupees (about US\$ 17), to 3,500 rupees (about US\$ 117), from which Mr. Singh makes a two per cent commission.

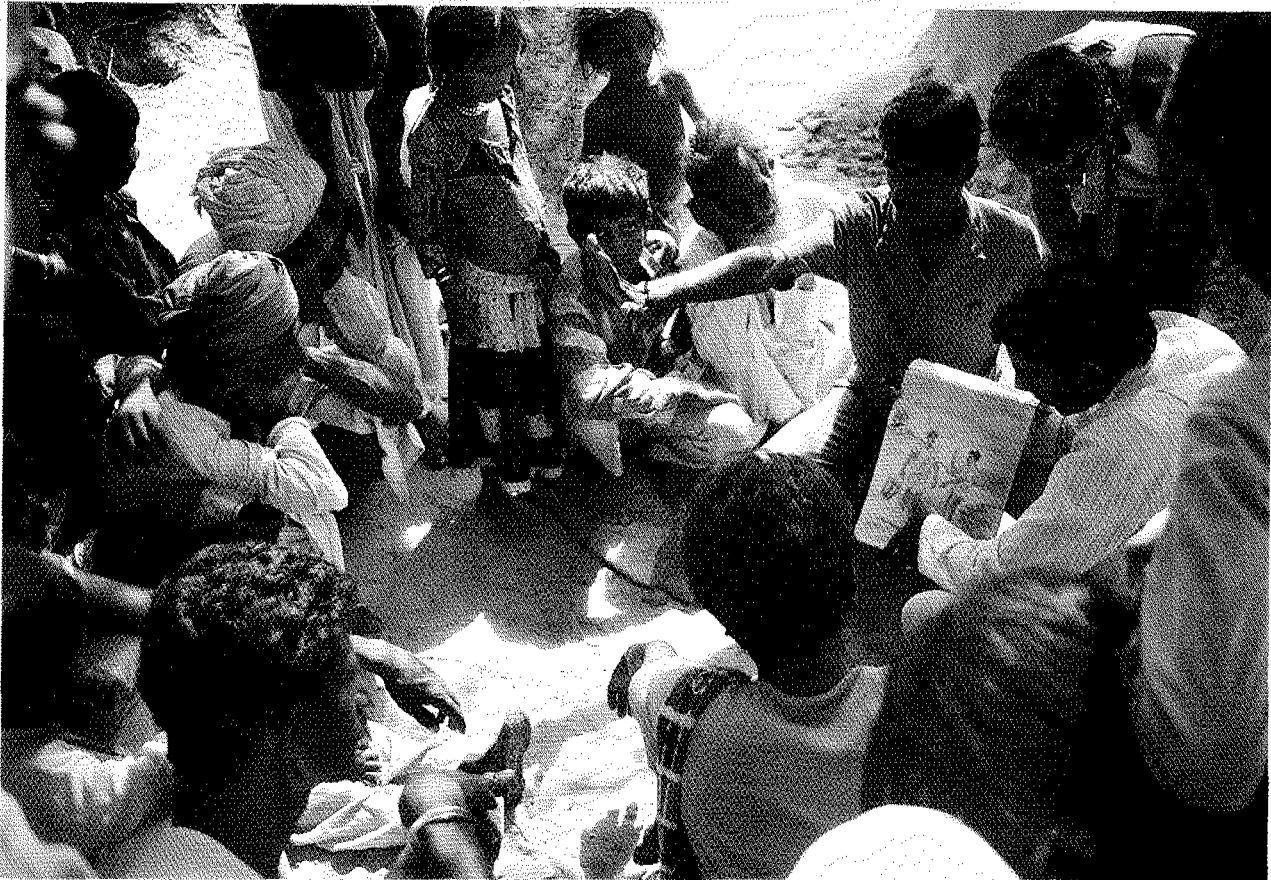
This unique experiment in self-financing sanitation gives the lie to the traditional wisdom that says that people are unwilling to pay for their own latrines.



▲ Traditional jhamas for scrubbing the feet, are part of the Najafgarh RSM ware.



▲ Najafgarh workers prepare steel rods for strengthening a cement latrine platform.



Working Through the Community

Mobilizing the community to decide where to place water sources and training village women (and men) as handpump mechanics were first steps in community participation in the water supply and environmental sanitation programme. In UNICEF-supported projects, this process of decentralization has been further enhanced by the village contact drive, a method of bringing information to people at their doorsteps, and the creation of WATSAN committees at the village level.

During a village contact drive, NGO volunteers spend two days in a village, delivering messages on safe water and sanitation to people, especially mothers. (Not only are women the prime water and sanitation managers, they are also responsible for passing on hygiene information to

children.) Various media are used, such as wall paintings, folk music and dance, street theatre, discussions and traditional early morning processions (called *prabhat pheries*).

Villagers are urged to set up WATSAN committees, which make decisions about village water supply and channel contributions towards the installation, repair and maintenance of handpumps and the payment of women handpump mechanics. The members of the WATSAN committees, many of whom are women, have proved to be excellent promoters of personal hygiene and environmental sanitation, as well as of information about immunization, nutrition and primary education.

Animators discuss the guineaworm cycle with nomads in Jodhpur district, Rajasthan.

School Sanitation: Hygiene Awareness at an Early Age

A 1992 survey carried out by UNICEF in 15 districts revealed that although 90 per cent of adults who have household latrines use them regularly, this was true of only 15 to 25 per cent of children. For this reason, and because children are receptive to new information, UNICEF is supporting school sanitation efforts in a number of districts throughout the country.

The School Sanitation project aims to develop sanitary habits among school children, particularly in the primary grades. Teachers and students are focal points for promoting a sanitation package to the student's household and to the community, allowing not just child-to-child relaying of sanitation messages, but child-to-parent as well. Hygiene education is becoming an integral part of the school curriculum.

School sanitation projects are active in a number of states, including Haryana, Tamil Nadu, Orissa, Uttar Pradesh, Rajasthan and Bihar.

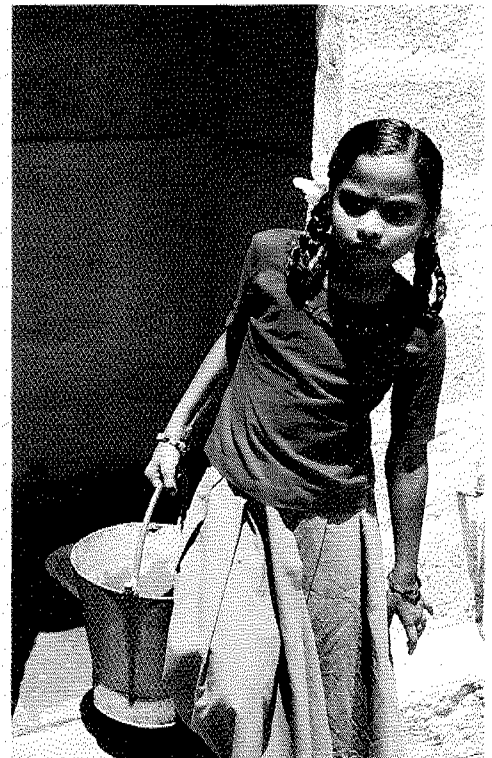
Schools are a part of many village contact drives. Special children's water fairs offer a variety of activities—including children's videos and drawing contests—all with a sanitation message.

A prabhat pherie by school children is used to convey information about hygiene.



Girls are still more likely to do the work, even at school.

Children are encouraged to maintain school latrines.





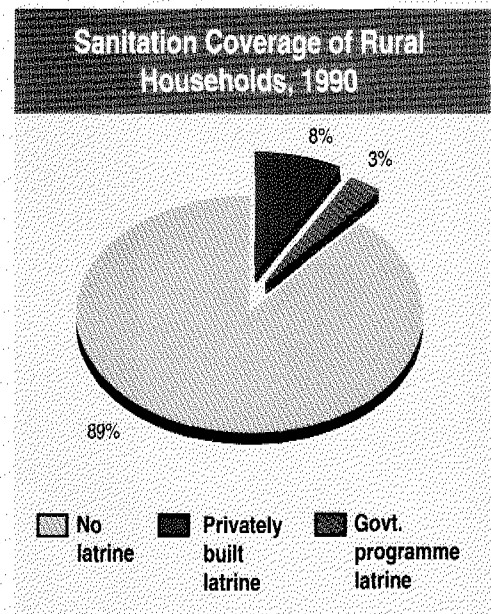
Mothers are taught the basics of hygiene, nutrition and breastfeeding, as well as how to manage diarrhoea with ORS.



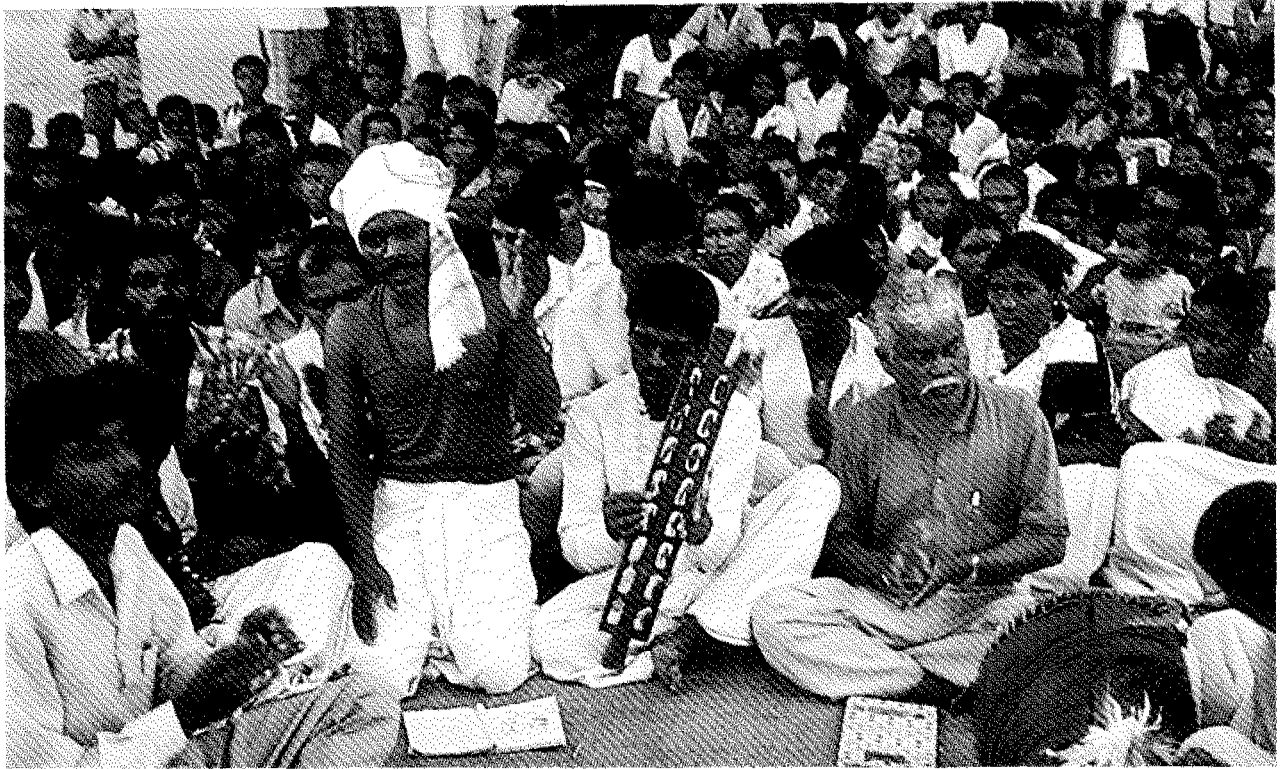
CDD-WATSAN: Preventive and Curative

A 1992 study of mothers and health practitioners in India revealed that only 14 per cent of the doctors and 6 per cent of the mothers used oral rehydration salts (ORS) as a first response to diarrhoea. The study also showed that mothers consider diarrhoea to be a common, almost inevitable problem, but one that is not very serious.

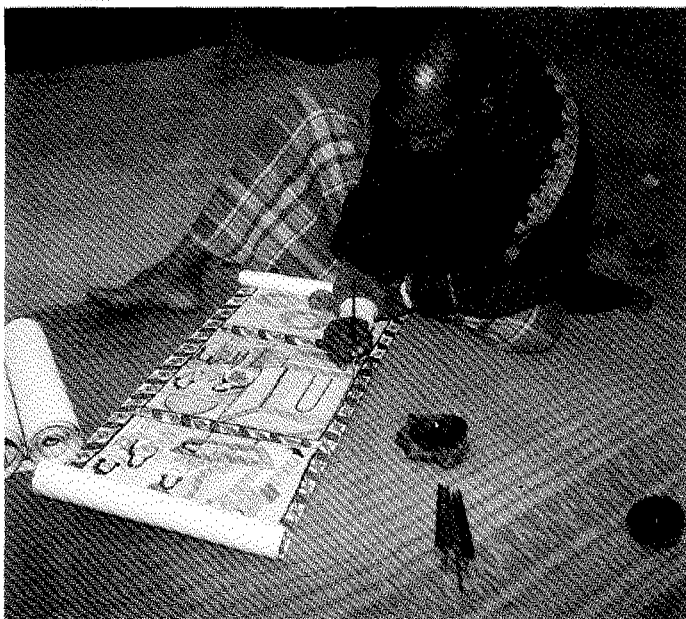
The Control of Diarrhoeal Diseases—Water and Sanitation (CDD—WATSAN) strategy, active in 15 districts in 15 states and expanding, works to combat these notions. It aims to reduce the incidence of diarrhoeal diseases by improving access to drinking water, sanitation and health services, and by training mothers to prevent diarrhoea through sanitary practices and to manage it with oral rehydration therapy (ORT).



Animators visit women at their homes to discuss how to prevent diarrhoea and to demonstrate ORS use.



Old folk tunes sport new lyrics that contain information about safe water and hygiene.

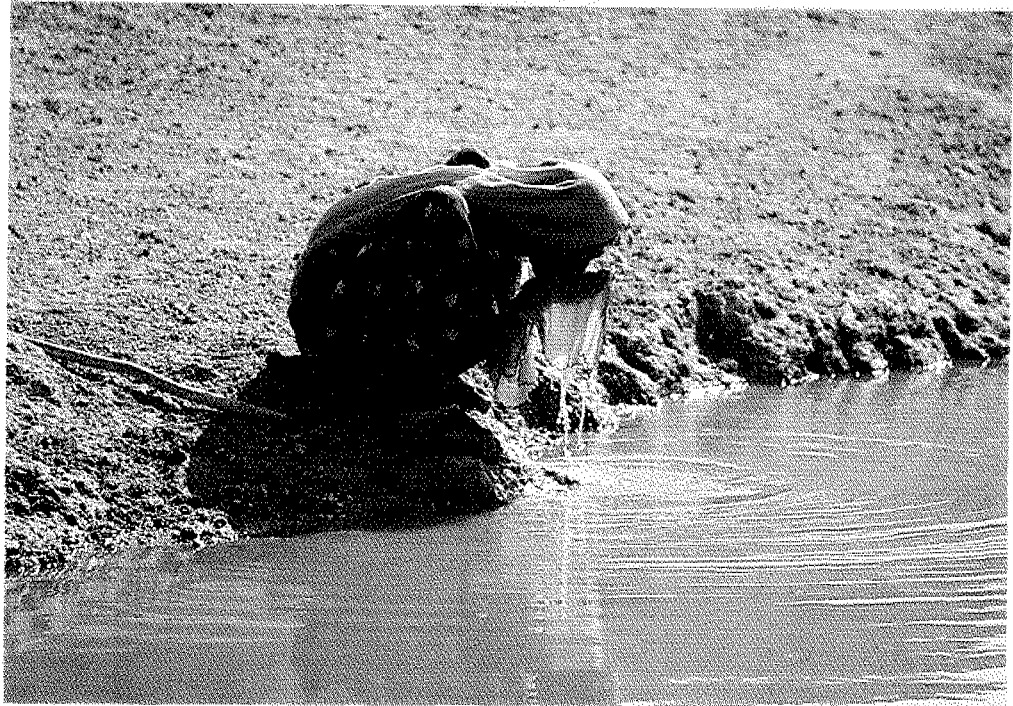


Modern sanitation messages are expressed by a traditional artist.

The Goals: Where We Stand on Environmental Sanitation

The global goal for all countries for sanitation is universal access by the year 2000. In India, this would mean providing 97 million rural families with latrines! The National Plan of Action for India commits itself rather to *progressive improvement* in access to sanitation, with variations between the states, depending on their specific conditions and resources. And while it is not possible to provide universal access to latrines by the year 2000, the universal promotion of hygienic sanitation practices that will greatly improve the quality of life for rural families is possible.

Guineaworm Disease Eradication



Guineaworm disease (or dracunculiasis), once endemic in India's desert and semi-arid regions, is transmitted by drinking water. The largest number of guineaworm cases is in Rajasthan although there are still a few cases in Madhya Pradesh and Karnataka.

The Guineaworm Cycle

The larvae of the guineaworm live in water where water cyclops feed on them. When a person drinks this water, she or he also drinks the larvae. Though the cyclops die, the larvae grow into hard worms up to a metre long. When a female worm has matured after about twelve months, it comes out through the skin, normally in the arms or legs. It causes terrible itching and a wound in the skin, which is soothed by water. When the affected area is bathed in water, the worm ejects her larvae and the process begins again.

Although the disease is not fatal, it can cause serious infections and at worst, tetanus. It can also cripple its victims if a worm dies inside the body and becomes calcified. People inflicted with the disease are ill for one to three months.

It is difficult to recognize the relationship between guineaworm disease and water because of the worm's one-year incubation period.



This stepwell in Udaipur district has been converted into a protected well with a pulley and bucket.



Wall paintings tell people how to prevent guineaworm disease.

Breaking the Cycle

SWACH, which means “clean” in Hindi, is an acronym for the UNICEF-assisted Sanitation, Water and Community Health project in Rajasthan. It was set up in 1986 in the two southernmost districts of the state, Banswara and Dungarpur, and has since been extended to Udaipur and Rajsamand—districts that have been plagued by guineaworm. Three-quarters of the inhabitants of the area covered by the project are “tribals,” meaning original inhabitants, and the majority of them are very poor.

The incidence of guineaworm disease increases during dry periods when there are few available water sources and those that remain are more liable to be contaminated. A common source of water in Udaipur is the traditional step well. The women normally walk directly into the water, wash themselves and perhaps the family’s clothing, take a drink and fill their water vessels. This is a perfect way to transmit the guineaworm larvae.

The SWACH project, using a community-based approach, has developed a number of strategies to break the life cycle of the guineaworm. Village animators are trained to make people aware of the relationship between drinking water and guineaworm and other water-borne diseases. Converting the stepwells into draw-wells or covered wells with a handpump ensures that people cannot walk into their drinking water source and thereby infect it. People are taught to pour water that may be infected through a fine mesh nylon filter, thereby eliminating the disease-causing water cyclops. In some areas that still have open wells, fish that feed on the water cyclops are placed in them. A reporting system has been set up that provides both the reporter and the victim a cash incentive for reporting guineaworm cases. Finally, people infected with guineaworm can have the worm removed surgically with the help of



❖ An ayurvedic doctor treats his patient at a dispensary in Jodhpur district. She had eight guineaworms extracted over a period of two months.

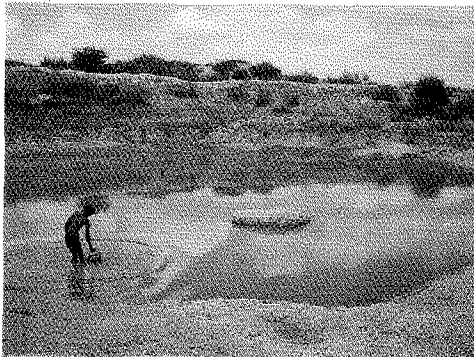
Guineaworm extraction, performed in an antiseptic setting, takes only about 15 minutes.



❖ The right time for extraction is when the guineaworm is visible underneath the skin.

a traditional ayurvedic doctor. Early removal shortens the length of the illness and ensures that the worm does not die inside the body. More importantly, it guarantees that the worm does not emerge and eject larvae into water, continuing the cycle.

These strategies, enormously successful in Udaipur district, are being adapted for use by the government in the Rajasthan Integrated Guinea worm Eradication Project (RIGEP), begun in 1992 in Jodhpur district of Rajasthan and in Dhar district of Madhya Pradesh.



◀ A boy wades into the water, possibly renewing the guineaworm cycle.

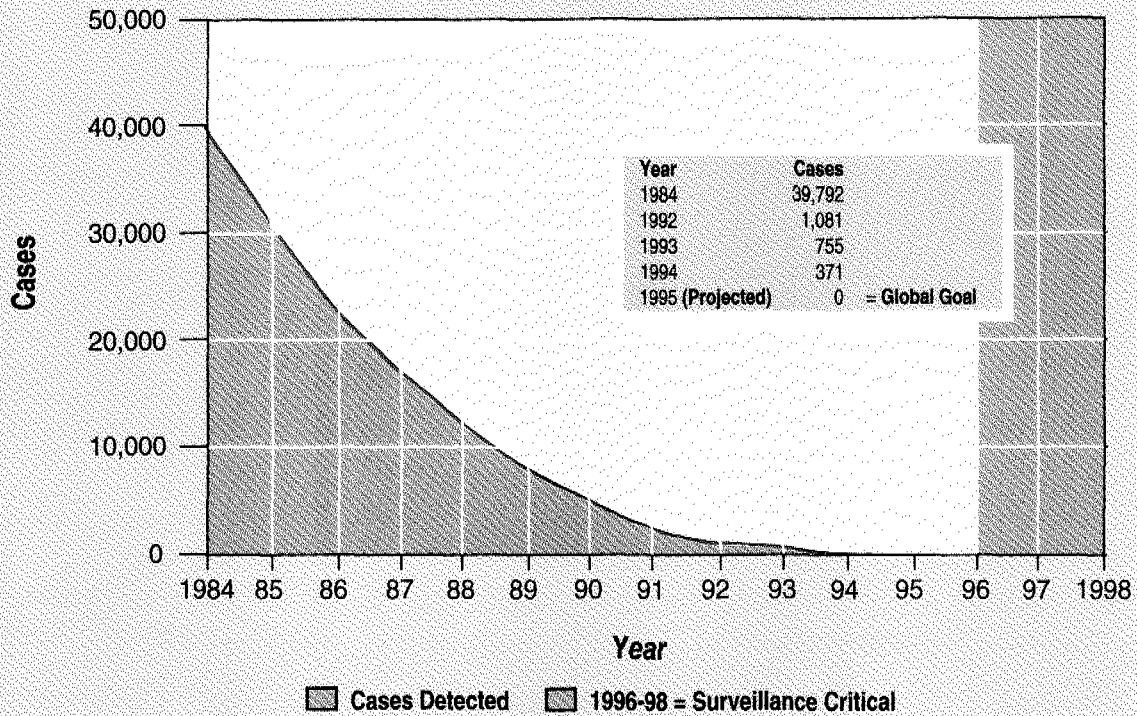


◀ Every household in a guineaworm area receives a fine mesh nylon sieve to filter out the water cyclops carrying the guineaworm larvae.



◀ Animators discuss the guineaworm cycle with a women's group.

Guineaworm Eradication 1984 - 1994



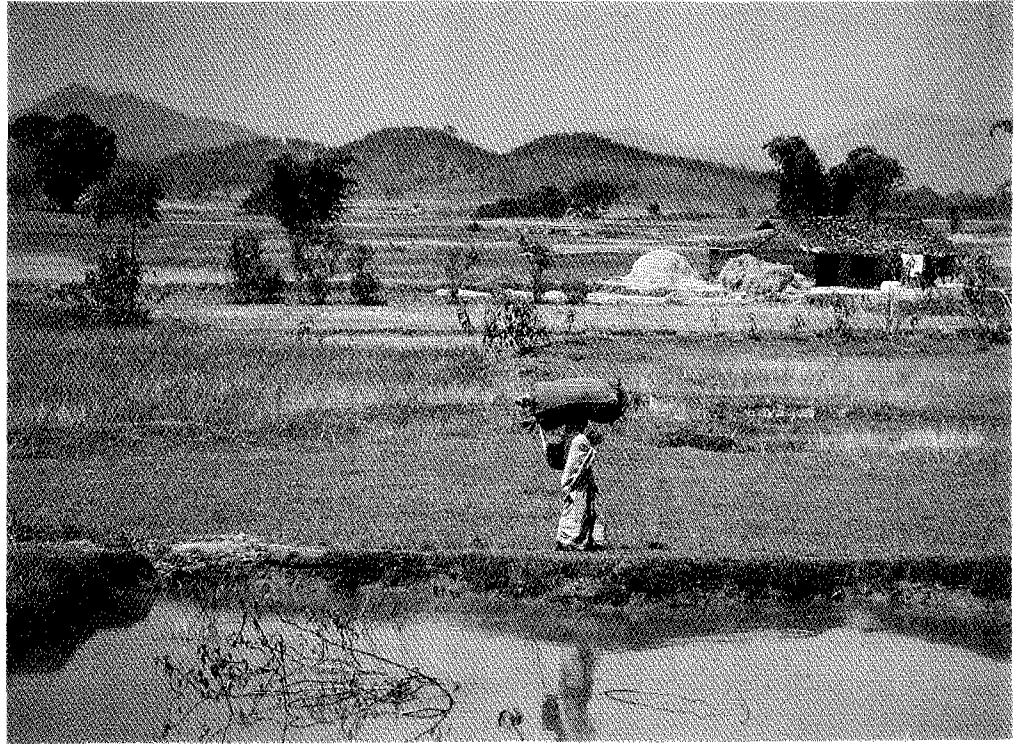
Source: MCD



The Goals: Where We Stand On Guineaworm Eradication

Since being targeted as a part of the programme of the International Drinking Water and Sanitation Decade in 1981, there has been a dramatic decline in the number of guineaworm cases in India: from 39,792 in 1984 to 1,081 in 1992, 755 in 1993, and only 371 in 1994.

It is expected that there will be no cases of guineaworm in 1995. Eradication will be considered complete after three years of "zero cases," as shown in the graph above.



Water Scarcity

In some areas, boreholes that were drilled in the 1970s have gone dry, and new wells in the same location must be drilled to twice the original depth. The tendency just to "drill deeper" to find the groundwater has made the situation so serious that unless major legislative changes are made quickly the existing handpump technology may soon be obsolete. Not to mention that water will become an even more precious commodity than it is now.

Groundwater Quality

The quality of the groundwater is a problem in a number of areas of the country. Parts of Bihar, Kerala, Madhya Pradesh, Tamil Nadu, Orissa and Uttar Pradesh have high concentrations of iron in the water. This may be in part a natural phenomenon, in part caused by pump materials. Iron is not harmful but it makes the water taste bad and it ruins clothes washed in it. Most importantly, it forces people to return to their unsafe water sources.

There is an excess of fluoride in the groundwater in parts of Andhra Pradesh, Rajasthan, Uttar Pradesh, Tamil Nadu, Maharashtra, Gujarat and other states. It is not an isolated problem: the number of people affected by fluorosis, which causes dental problems, gastroenteritis and crippling, is estimated at an appalling 25 million.

A Gujarati couple crippled by excessive fluoride, which affects 25 million people in India.



SALMI PAUL / ROYAL NETHERLANDS EMBASSY

Seeking Practical Solutions

Salinity is a problem in a number of coastal areas where the over-extraction of groundwater has caused irreversible salt water intrusion.

Perhaps most disturbing, six districts in West Bengal have been found to have arsenic in their water supplies. This relatively recent occurrence is probably related to over-pumping. Arsenic discolours the skin and even low intakes cause cancer.

A number of solutions are being tested for these problems. In most instances, scientific techniques are available: the challenge is to develop them for practical use by rural communities. For example, in Unnao village in Uttar Pradesh, UNICEF is promoting the treatment of water containing excessive fluoride using the activated alumina process. Both community-level and household filters are being tested.

Waste water and other industrial wastes are chiefly a problem in the peri-urban areas but must be monitored in rural areas as well. The *Pollution Control Act* aims to regulate the pollution of water, soil and air but in every case it is necessary to prove where the contamination is coming from in order to force any changes.

It Tastes Fine...

Bacterial contamination is the main problem facing the rural water supply programme. Many people do not know that the water they drink may contain harmful germs. After all, it looks clean and tastes good! The hygiene awareness programme promoted by village contact drives and WATSAN committees emphasizes the importance of hygienic water-handling and waste disposal practices.

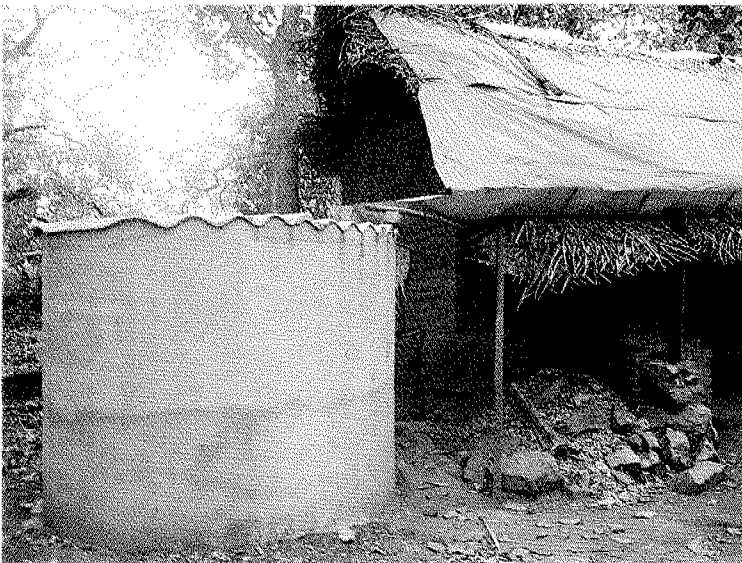
This woman is not aware of the link between water and health.



Protecting Drinking Water

There are as yet no wide-ranging laws to govern the use of groundwater in India. The Central Groundwater Board has delineated areas where further groundwater development is prohibited, but these become applicable only if an individual who wants to drill a new borehole is asking for a government loan. This means that the well-off can drill wherever they want.

Legislation to prevent the over-exploitation of groundwater is needed but it must be well administered through a social fencing policy that gives priority to wells used exclusively for drinking water. Such legislation would state, for example, that no other well could be drilled within 500 metres of an existing one.



Rainwater harvesting is being promoted in a number of districts of Tamil Nadu.



Primary Environmental Care

Environmental issues are an integral part of UNICEF programming, which uses the model of primary environmental care (PEC). PEC programmes work to prevent two types of environmental deterioration: resource degradation such as groundwater depletion, erosion of topsoil and deforestation; and pollution of water, air and soil. Using a community-based approach, PEC aims to change people's behaviour in order to combat any environmental degradation.

In India, UNICEF is advocating several schemes to protect or recharge groundwater. One is reforestation, which will cut down on surface water runoff. Other areas of focus include gravity feed systems for spring water and low-cost alternatives like dug-well protection and rainwater harvesting. Rainwater harvesting is most easily managed in hilly areas, where people have slate or tin roofs, but it is also possible in other areas, even desert regions. Because in most parts of India it only rains heavily at certain times of the year, a large underground storage area is needed so the water won't evaporate. In some cases it is best to use artificial groundwater recharging techniques in which the depleted aquifer itself stores rainwater.

Clearly, none of these schemes can be used throughout the country, so a great deal of research is necessary to devise the best solutions for each area.





Research and Development

UNICEF research and development in water supply concentrates on solving the problems of those who do not have a safe water source (e.g., developing a light-weight rig that can be easily transported to hilly areas, rainwater harvesting techniques, protected dug wells, fluorosis control, iron removal) and on ensuring sustainability (e.g., continuing to improve community-based handpump maintenance by making the VLOM pump ever more village-friendly).

Environmentally friendly and low-cost sanitation technology is the focus of sanitation research and development.

Management Information Systems

UNICEF supports central and state governments in the development and implementation of user-friendly computer-aided management information systems. This involves establishing data banks for village level data, including the history of water sources and water supply schemes to promote efficiency and facilitate decision-making in sectoral activities. The priority is to ensure a minimum level of water and sanitation facilities to the unserved population.



How UNICEF Operates

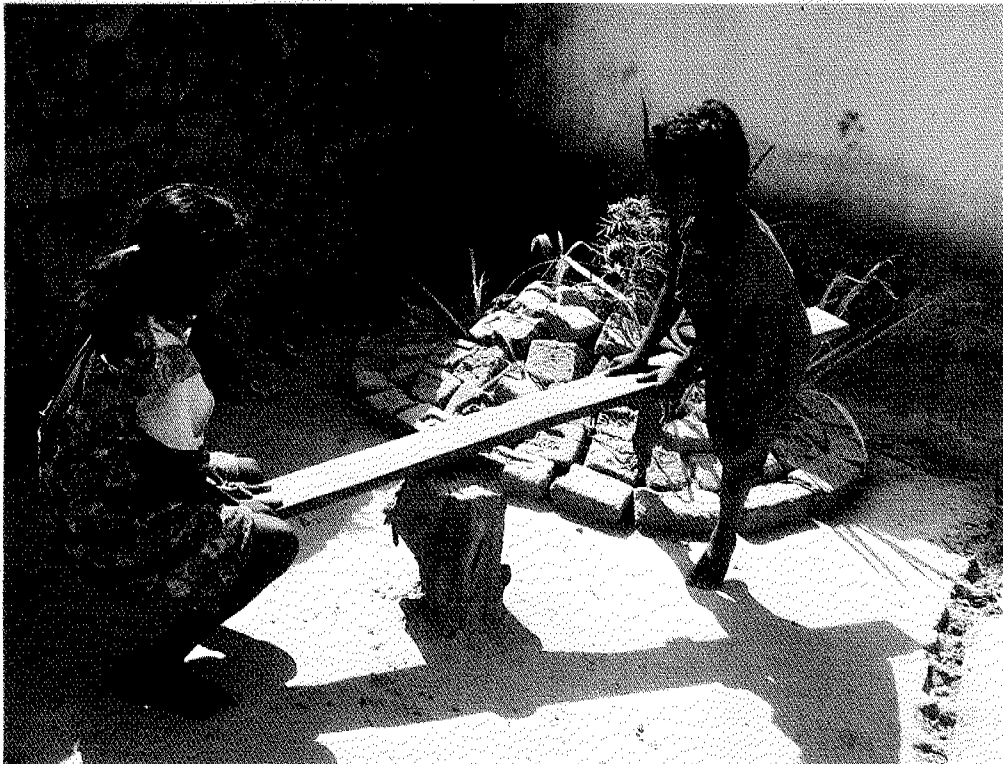
UNICEF India has a central office in New Delhi and ten field offices. Its principal partner in water supply and sanitation is the Rajiv Gandhi National Drinking Water Mission of the Ministry of Rural Development, with its state counterparts. UNICEF works within the framework of national government policy, in close cooperation with state and district-level organizations and NGOs.

Its relationship of trust with the Government of India has allowed UNICEF great flexibility as well as the ability to try out new ideas. In many cases, the UNICEF role is to pilot new approaches (e.g., women as handpump mechanics, the self-financing of sanitary facilities through the rural sanitary mart) and new technologies (e.g., the India Mark II handpump), which are both cost-effective and user-friendly, and which are then replicated by the government on a large scale.

With its access to foreign currency and international consultants, UNICEF is able to keep in touch with the latest developments both in technology and in development theory and practice.

Committed to building local planning and management capacity, UNICEF has developed a wide range of training programmes in all aspects of water supply and sanitation, as well as in communications skills.

UNICEF receives funds from General Resources (UNICEF funds) and from Supplementary Sources (i.e., donated funds). It continues to seek funds for the projects it supports. The programme's major donors have been Sweden, Denmark and the Netherlands. Canada, Britain and Germany have contributed emergency support.



Looking to the Future

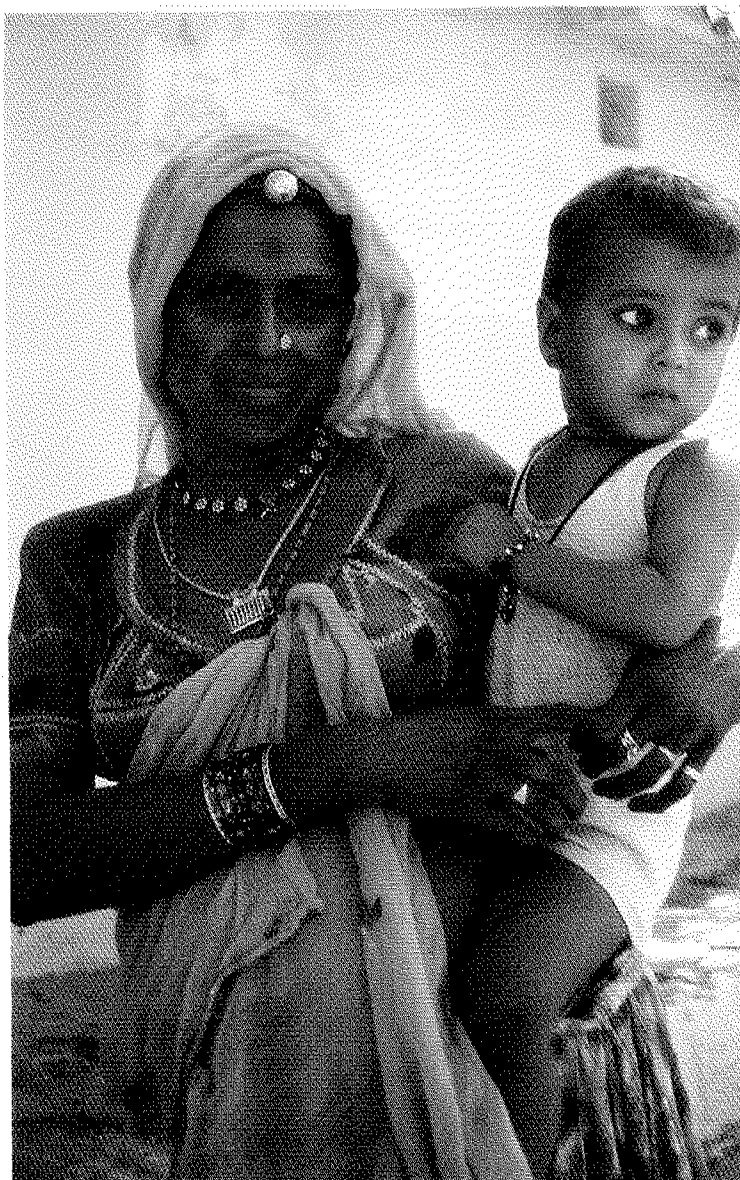
The India Rural Water Supply and Environmental Sanitation programme faces enormous challenges as it approaches the year 2000, not just to achieve the goals set at the 1990 World Summit for Children, but to ensure community "ownership" of the process, which in turn will help secure the programme's sustainability.

As we have seen, UNICEF's role in the programme began almost three decades ago in response to an emergency and expanded gradually. Even now its annual inputs are less than 3 per cent of the total government water and sanitation programme budget. Yet the UNICEF contribution has had a considerable impact, to the point where the programme acts as a model for other countries.

UNICEF will continue to work to enhance women's status and power in their communities, taking advantage of the opportunities offered by recent amendments to the Indian Constitution and the resulting decentralization of legislation. The 73rd Amendment to the *Panchayati Raj Act*, as well as reserving seats for "tribals" and "scheduled castes," retains one-third of seats at district, block and village panchayat levels for women.

Bringing water points closer and reducing the number of users per pump, according to the new coverage norms, will also supply families with a larger amount of water than they have now. This, along with providing a protected water source for every health centre and school and the gradual changeover from the India Mark II handpump to the more "village-friendly" pumps, with community contributions for their maintenance, will be key areas of focus.

The programme will make a country-wide effort to promote the concept of sanitation as a package, emphasizing hygiene awareness, private initiative and technology choice.



UNICEF will continue to advocate for legislation to protect drinking water and improve its quality, as well as to help develop alternate water delivery systems, including gravity feed systems, solar pumping technology, rainwater harvesting and sanitary dug wells.

Finally, with a focus on "the child and her environmental habitat," the Water Supply and Environmental Sanitation programme will reinforce its linkages with other sectors, directing increased emphasis on the control of diarrhoeal diseases, hygiene education and primary environmental care.

Glossary

animator: a local person chosen by the community who is trained on water and sanitation issues and who takes the information back to the community. Animators canvass house-to-house and facilitate “mother’s meetings” and WATSAN committees.

block: a group of about 100 villages.

chulha: an earthenware stove used in many parts of India. Firewood or cowdung cakes normally serve as fuel.

handpump caretaker: a young man or woman who preferably is literate and a regular pump user. Their job, a voluntary one, is to undertake preventive maintenance and keep the pump platform and drain clean, report pump breakdowns and

keep records of breakdown and repair.

mistri: village handyman.

motivator: used synonymously with “animator.”

ORS: oral rehydration salts, a treatment for diarrhoea.

ORT: oral rehydration therapy, the use of ORS.

panchayat: a democratic village political structure, which oversees two to three villages and a population of about 2,400. There are 217,300 village panchayats, covering 96 per cent of the 587,000 villages in India.

WATSAN: water and sanitation.



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