

FEATURE

A monthly features service on scientific, technical, and educational subjects pertinent to development.

SCIENCE WORLD

(a collection of development-oriented science news briefs that may be used as a column, or as separate items)

INDIA'S VILLAGE PUMP DOCTORS

(approx. 230 words)

A pump that brings clean water for drinking and washing will improve the people's health -- but who will care for the health of the pump?

In India's Tamil Nadu state hundreds of pumps were installed following a severe drought in 1975, but within a year 80 percent of them had failed. So the state government launched a scheme to train "hand pump doctors". Chosen by the villagers themselves, the volunteers attend a two-day training course. They learn about the anatomy of the pump and how to diagnose and treat common pump ailments. They are also taught the importance of drainage, and the relationships between water and disease.

Back in the village, equipped with a tool kit, the pump doctor runs weekly checks on the pump and carries out preventive maintenance and minor repairs. In case of more serious problems a pre-stamped reporting card will summon expert help -- either an inspector-mechanic, or, in case of major difficulties, a mobile repair team. This three-tier maintenance system has been so successful that it is now being introduced in other states as well.

But the pump doctor's job also involves his fellow villagers: trying to wean them away from unprotected water sources and teaching them the importance of storing water only in clean containers. The doctor's message is simple: "Drink clean water for a year and see the difference in your health."

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HOME GROWN WATER SYSTEMS

(approx. 260 words)

One solution to the high cost of piping water into remote rural villages may be for the villagers to grow their own pipes. Bamboo has been used for many years in hill villages of Asia for gravity-fed water supply,

but the pipe usually has to be replaced every two or three years. Now scientists are looking at ways to improve the bamboo pipelines.

In Taiwan they have found that treating bamboo with boric acid as a preservative greatly extends the pipe's life -- perhaps for as long as 15 years -- without harming the water. In Indonesia 24 villages teamed up under the guidance of a young engineer to build a network of bamboo water pipes that stretches for 90 kilometres and serves 60,000 people. In Tanzania researchers are devising planting programs to ensure a constant supply of mature bamboo.

Once cut, the bamboo must be treated and used immediately or it will be attacked by termites and fungi. Burying the pipe in a shallow trench covered with leaves can more than double its useful life. Problems with leaky joints can be solved by using a mixture of tar and cotton wool as a sealant. Strips of old rubber inner tubes are also effective.

Now researchers are working on ways to strengthen the pipe and improve the joins so that bamboo can be used for pressurized water systems. Experts for the World Health Organization believe a pressurized bamboo system could serve a village of 200 for about \$1 per person.

Bamboo pipes may have their drawbacks, but for simplicity, cost, and availability, they are hard to beat.

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HARVESTING THE RAINS

(approx. 260 words)

Collecting water during the rains and storing it for later use is a practice that dates back thousands of years. But it works only where conditions are right. If the ground is too permeable it will simply absorb the rain; if it is too steep the runoff is so violent it can cause serious erosion problems.

Simple technologies to harvest rainwater are being developed in many countries. An underground tank lined with polythene sheeting can form a catchment area. Inside the tank domed beehive-like structures are built, then the whole thing is covered with sand. The sand acts as a filter, and the "beehives" prevent evaporation. Systems like this are in use in Botswana, Brazil, Jamaica and Sudan -- some capable of holding up to 90,000 litres of water.

Above ground the catchment area can be extended by grading, by laying concrete or asphalt, by chemically treating the soil surface to reduce permeability, or simply by laying plastic sheeting on the ground.

Another source of water is the roof over your head. The roof of a small house, even in a semi-arid region, may be able to provide as much as 10,000 litres of rainwater. And in the highlands of Kenya enough water can be collected in a 12-hour downpour to last a family for six weeks or more. All that is needed to harvest it is a gutter, some drainpipe, and a covered tank.

By utilizing rainwater from the roof and building small catchment tanks, experts believe many families presently without a water supply could be self-sufficient in water.

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