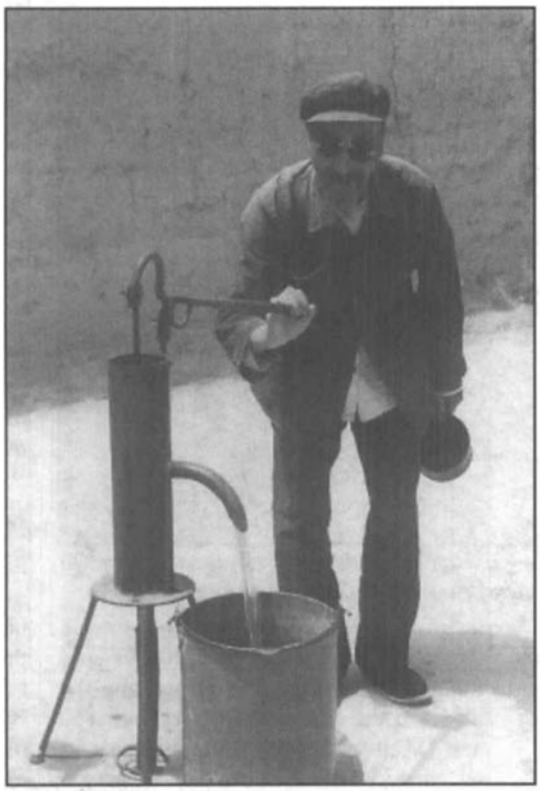
waterpoints

Gansu revisited

In October 1995, we published an issue of *Waterlines* devoted to the resurgence of interest in one of the world's oldest, tried and tested technologies: rainwater catchment. An article on a successful new catchment design being implemented in the dry Chinese region of Gansu attracted a lot of interest.



Fuxue Wu

Gansu resident, Zhengmin Wei, built his own rainwater catchment system in 1992.

Incorporated into the article was an item about Project 121, which hoped 'to provide drinking-water for at least 1.2 million people — 300 000 by the end of 1995.' Now the author, Zhu Quiang, has written describing the success of the initiative:

'During the past year, the Gansu Provincial Government has supported the '121' Rainwater Catchment Projects in the driest counties in the mountainous area of the province. The '121' means: each family in the project area built one rainwater harvesting field with an area of about 100m^2, two underground water tanks (*shuini shuijiao*), and one plot irrigated by the collected rainwater, and planted with cash crops. In addition to the financial support provided by the government, the people of the region contributed about 50 million yuans (US$6.5 million) to the running of the project.

Within a year, 230 000 families — totalling 1.2 million people — have built RWCS, and solved their drinking-water problems. They also benefited from their irrigated small plot which enabled them to grow fruit and vegetables. Statistics show that about 10 000ha of small plots were irrigated in 1996 by RWCS.

On the basis of 121's spectacular success, the government has decided to implement a new initiative: a rainwater catchment irrigation project which will enhance agriculture production in the present rain-fed area of the province. The planning stage is almost completed, and six pilot villages will be built before the end of 1997.'

Netting pollution

The latest internet site to be launched by the World Bank comes from their Policy Research Department's Environment, Infrastructure and Agriculture Division (PRDEI). Called 'New Ideas in Pollution Regulation', the site houses the work-in-progress for PRDEI's 'Economics of Industrial Pollution' research project and other related resources. The Bank describes it as the culmination of four years' work with environmental protection agencies in developing countries.

PRDEI intends to use the NIPR site to distribute research results, and to create a dialogue with people working in the field. It is looking to expand NIPR to serve as a primary resource for anyone interested in industrial pollution issues by including materials from economists, academics and field researchers.

If you want to find out more, add yourself to the Introduction's List on: http://www.NIPR.org/intros/index.htm This site also provides you with the opportunity to post related research.

Cleaning up arsenic and old waste

Arsenic could be removed from contaminated drinking-water or mining waste using just sunlight and air, according to researchers in Australia.

Arsenic contamination of drinking-water is a major problem in countries such as India, Thailand, and Mexico. In some of its affected areas, the Indian Government issues chlorine tablets to add to the water. The tablets oxidize the highly toxic arsenic (III) to the less harmful arsenic (V), which can then be precipitated out using iron to form iron arsenate. But the use of chlorine generates chloroform, which is itself a dangerous chemical.

Now a team of scientists working with the Co-operative Research Centre for Waste Management and Pollution Control in Sydney says that the arsenic can be converted to its less dangerous form simply by exposing the water to sunlight and aerating it.

Just as in the process described on pages 27-9 by Rob Reed, the ultraviolet radiation in sunlight helps the dissolved oxygen to oxidize the arsenic to the less toxic form, which can then be precipitated and removed as before.

The researchers, led by Ging Khoe, were initially only looking for an industrial process to deal with mining waste. But, says Khoe, when the researchers read an article on the widespread problem of arsenic in drinking-water, they realized their approach might be adapted to treat drinking-water.

The team recently demonstrated its idea in Butte, a small mining town in Montana, at the request of the US Government. The researchers used a cattle-feeding trough to hold contaminated water and Khoe says the process was 'very successful'. His team's vision for the South is of troughs dug in the earth and lined with plastic to hold the water. 'A trough would cost around £240 to build, and could supply the cooking and drinking needs of 500 people every day,' says Khoe.

For the more contaminated mining waste, UV lamps similar to those currently used to disinfect water can be modified to speed up the process. Using sunlight alone, the oxidization process for mining waste can take a

few hours, but for lightly contaminated drinking-water, it takes only a few minutes.

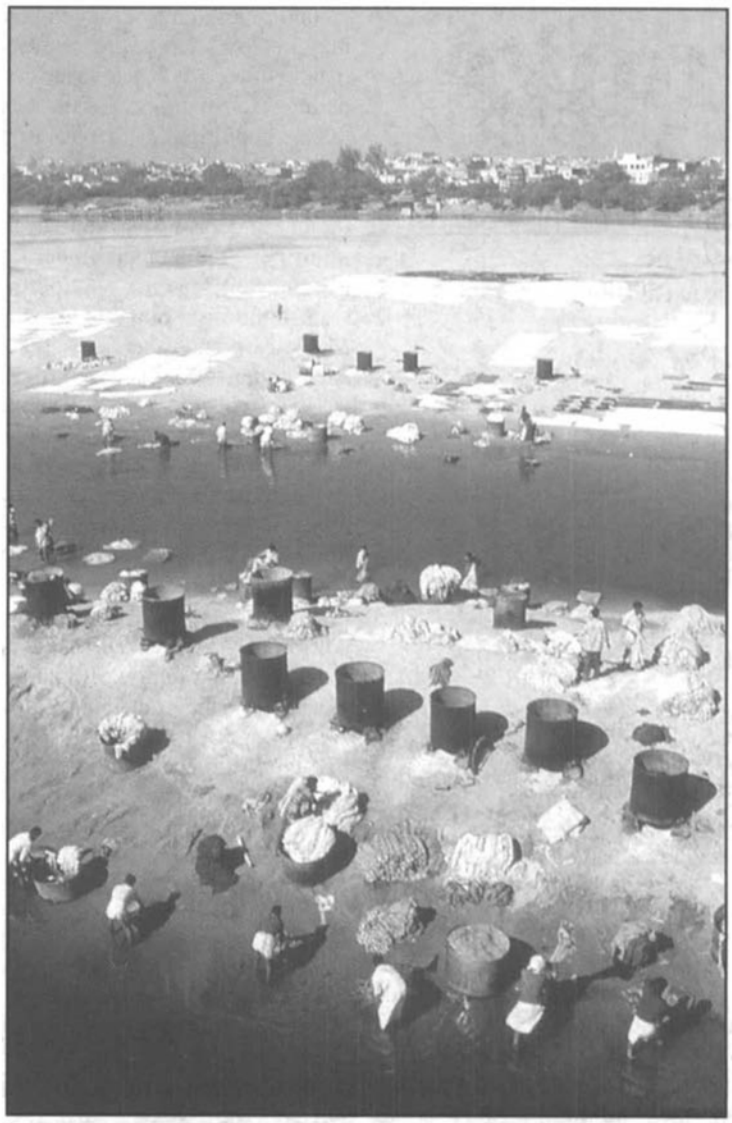
According to Khoe, the sludge-like precipitate can be further treated with existing processes to stabilize it. The arsenic can then be disposed of in landfill, and will not leach out into groundwater.

Taken from article by Emma Young which appeared in the *New Scientist* of 14 December 1996.

Water shortages worsening

By the year 2025, two thirds of the world's population could suffer from water shortages, warns a new report. The first-ever 'Global Environment Outlook', published by the Nairobi-based United Nations Environment Programme (UNEP), says that human use and pollution of water, soils, forests, fisheries and urban air 'is depleting these renewable resources faster than they can naturally recover'.

'If we allow these trends to continue', said UNEP executive-director, Elizabeth Dowdeswell, 'we will ultimately run out of the essential ingredients for life on this planet. We are on an unsustainable trajectory'.



Paul Harris

Washday on the Yamuna River in Agra, Uttar Pradesh.

Already, just over a quarter of the population struggles to obtain the water they need. But in 30 years' time, 27 countries, mostly in North Africa, the Middle East, and South Asia, could be in the UN's 'high water stress' category. They would include India and Pakistan.

The outlook calls for cost-benefit analyses to identify value-for-money programmes to tackle water shortages, and to promote 'drastic changes' in energy use. It also urges that more funds be made available. 'It is entirely within human knowledge and ability to solve even the worst environmental problems' said Elizabeth Dowdeswell; 'it is simply the will to act and funds to do the job that are vastly insufficient to the task'.

Trouble up North

But the problems are not confined to the South. The report declares that although North Americans consider themselves rich in natural resources, many lack the basic one: clean water.

Some 2.4 million people in the USA have a 'critical need' for safe, dependable drinking-water, while another 5.6 million drink water that does not meet safety standards, says UNEP. One in five American citizens drinks water from a treatment plant that violates safety standards, and water from 8 per cent of all treatment plants contains dangerously high levels of faecal coliform bacteria.

In Canada, 20 to 40 per cent of rural wells are contaminated with coliforms. Canadian Indians and the Inuit are especially badly off, with a fifth of their drinking-water systems failing to meet safety standards.

The US Government estimates that just meeting its 'highest priority problems with rural drinking-water will cost $3.5 billion', but points out that it has invested 100 times that amount to control water pollution in the past 25 years.