

Alternative Sources of Drinking Water

by Abu Shahjalal Azad and Dr A B M Badruzzaman

The main challenge is how to provide the millions of people at risk with arsenic-free, bacteriologically as well as chemically safe, and aesthetically acceptable alternative source of drinking water.

mediate challenge is to find out the unaffected ones in the affected areas and commence routine monitoring in order to stop using the currently affected tubewells as soon as arsenic is detected.

In view of the fact that ground water is safe for drinking and its harnessing is cheaper and sustainable, public as well as private water supplies are heavily dependent on this source.

Hundreds of tubewells in rural Bangladesh have been identified with high arsenic concentration and many more are feared to have been contaminated with the same.

However, geological formation is presumed to be the primary reason for arsenic.

The Challenges

The main challenge is how to provide the millions of people at risk with arsenic-free, bacteriologically as well as chemically safe, and aesthetically acceptable alternative source of drinking water.

The factors facing this challenge are:

- Identification of arsenic-free tubewells in the known affected areas.
Treatment of arsenic contaminated water where no other safe source exists.
Extent of the potential alternative sources, namely, surface water and rain water.
Habit, culture and custom of the people.
Economic condition of the people, and their willingness and ability to pay for the service.
Community motivation to face the challenge collectively.
Technologies.
Cost.
Monitoring.
Research and Development.
Institutional support.

Strategic Responses

Identification of arsenic-free tubewells: It has been observed that tubewells, public and private, exist in several numbers in any cluster or community.

A number of different organizations are conducting testing of tubewell water for arsenic. BUET, DPHE, NIPSOM, etc., are routinely conducting such tests to identify arsenic polluted tubewells at a large scale.

A comprehensive arsenic testing campaign was conducted by BUET in cooperation with the Ministry of Agriculture under the North-East Minor Irrigation Project (NEMIP) where 1,210 water samples from the six districts in the north-east zone of Bangladesh were tested.

Although a number of identification studies are currently being conducted at various parts of Bangladesh by different organizations, these are only short-term measures which can be accomplished quickly at relatively low cost.

Treatment of Arsenic Contaminated Water: The conventional coagulation and filtration methods seem to be more appropriate in this regard. Nath and Majumder (1997) were successful in achieving about 90 per cent removal of arsenic by co-precipitation with Ferric Chloride and 97 per cent removal with alum.

and Hossain (1997) at BUET studied the approach of co-precipitation of arsenic with iron precipitates in arsenic removal. About 95 per cent removal of arsenic was achieved during an initial run.

However, they noted that removal efficiency may deteriorate with use and recharging of filter media will be necessary after prolonged use. NIPSOM adopting the concept of co-precipitation developed a packet for household use with a mixture of alum and charcoal.

Identification of Arsenic-free Aquifer: As arsenic-free ground water is still the best option, efforts should be made to find such aquifers at deeper depths and install tubewells accordingly as an interim measure.

Exploitation of Surface Water: Although surface water is abundantly available during and some post-monsoon months, its volume depletes fast afterwards and become scarce in the dry season.

However, if properly installed after fulfilling the necessary conditions, pond sand filters have the potential for long term solution of the drinking water problem. However, the questions of community participation, funding and subsidy, roles of the government and the NGOs still remain.

nity will have to play vital roles in planning, implementation, operation and maintenance.

Initial investment cost may seem exorbitant but may prove feasible in the long run. Since no expertise for such intervention in rural Bangladesh exists some pilot projects may be carried out to gather essential experience.

Rain Water Harvesting: Rain water harvesting is economical if it rained round the year. For example, the total water use of Bermuda is being met by harvesting rainwater every year.

Other factors associated with this intervention include limited practical knowledge except for those living in the coastal areas thus, requiring extensive promotional work; intensive educational program; training on collection and monitoring methods, storage and use.

Technologies: Technologies such as treatment, storage and distribution for exploitation of surface water, pond sand filter for harvesting pond water, tubewells for abstraction of ground water, and ferro cement jar/tank for rain water harvesting are already in use in Bangladesh.

Field kits to test arsenic in water have been developed in many countries. Some kits including the one improvised by NIPSOM, are in use here. It should be noted that, policy decisions made based on data acquired through field kits may not be appropriate.

Water: Going with the Flow

Someshwar Singh writes from Gland, Switzerland

As Sweden prepares to present its eighth Stockholm Water Prize, the new interest of big business in global water supply offers an opportunity for investment in the earth's most precious resource. But conservation and management must be top of the agenda.

ALREADY famous for its Nobel Prizes, Sweden has had the vision to institute yet another award — this one for conservation. The Stockholm Water Prize, which honours a significant contribution to the conservation of the world's water resources, goes this year to Professor Gedeon Dagan of Israel, a groundwater specialist.

Protecting groundwater resources and avoiding further pollution is very important for Israel and the Middle East region," says Professor Dagan. "Because of the desert climate and scarcity of water, we must develop new techniques rather than use our resources to the maximum."

Well known for excellence in water-conservation techniques, Israel also treats 70 per cent of its sewage water for re-use. But on a wider scale, groundwater is the most important freshwater resource on earth, equalling more than double the total volumes of rivers and lakes.

This importance is recognized by the award, presented by its patron, King Carl Gustaf of Sweden, during the eighth Stockholm Water Symposium from 10 to 30 August.

and Quality of Life." Central to the theme are issues such as water scarcity, groundwater management and water harvesting.

"Sweden is certainly playing a pioneering role in spreading awareness of the need for change and promoting respect for water," says Dr Biksham Gujja, Head of the Freshwater Programme at WWF International.

"We need to adopt a holistic, catchment approach to water management, to encourage research into traditional small-scale water-use techniques, and to stop leakages and waste in water distribution while promoting re-use of waste water."

Indeed, conservation efforts are a more potent weapon than guns in settling international water disputes. Experts estimate that many countries can reduce water use by about 50 per cent through implementing well-known water conservation and affordable production methods.

took place this year against the backdrop of a significant new development in the water business. American multinational Enron was adding to its gas and electricity interests by buying Britain's Wesssex Water company as a first step towards building a global water business.

"This could become as large as our natural-gas or electricity business in just a few years," Enron chairman and chief executive Kenneth Lay said at a recent conference.

WWF — World Wide Fund For Nature — believes the entry of big business into the water sector should be guided by the broader ecological and environmental concerns that ensure a sustainable supply of freshwater.

Bit business has the means to invest in technical innovations that promote water conservation. What it must demonstrate is the will to do so.

— WWF Feature

Employers Count the Cost of Equal Pay Victory

A landmark ruling in Canada has decided in favour of equal pay for women workers in government. The cost of backdating the award will be huge, reports Gemini News Service, and other employers are now reassessing their policies. Sharon Gerein writes from Regina, Canada

IT was a hard-fought victory — 14 years of legal proceedings, including a six-year struggle at Canada's Human Rights Commission.

But battle over pay equity has finally been won by about 200,000 Canadian civil servants, most of whom are female.

The campaign was waged by the Public Service Alliance of Canada, which complained that women workers in six job categories, ranging from librarians to clerks, were grossly underpaid compared with male counterparts doing similar work.

In late July, after six years consideration of the case, the human rights tribunal decided that the complaint was legitimate.

It determined that the federal government has to give back-pay and interest to nearly 200,000 people.

The landmark ruling has left the federal government reeling because the cost of arrears is estimated at between Cn\$1.5 billion and Cn\$8 billion.

The government has until the end of August to decide whether or not to appeal.

But for civil servants such as Christine Collins, the battle is over.

Until four years ago, Collins worked in what the tribunal called the job ghetto. She spent about 13 of her 17 years working in junior clerical positions as a word-processing operator, a secretary and a clerk until she became a supervisor for Transport Canada in Ottawa.

Collins estimates she is owed about Cn\$15,000, plus up to Cn\$5,000 in interest.

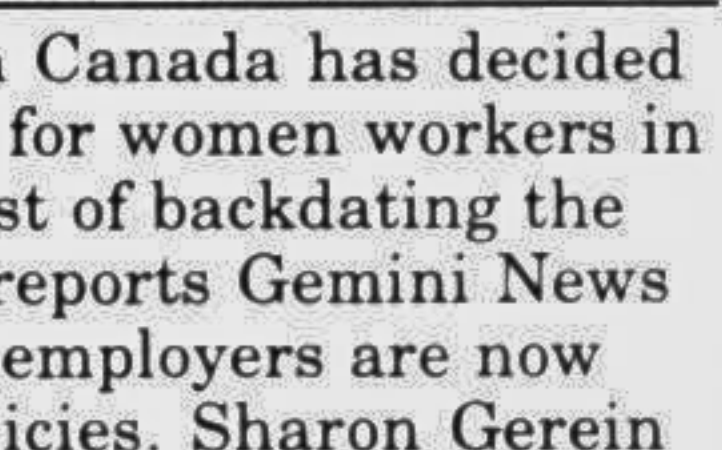
For Collins, a single parent, the money is welcomed but it is not what the fight was about.

"It's about respect," she says. "The ruling has been a huge moral booster. Pay-equity in the work place finally gives us some respect. Finally, someone is saying that what we do is valuable."

Collins says that it has not been an easy time. She recalls how, in opposition, Prime Minister Jean Chretien's Liberal Party fought for pay equity, but once elected, carried on the previous government's fight against it.

"Even how we were treated during the tribunal smacked of disrespect. The federal Treasury Board appealed everything they could during the hearing. They've spent millions fighting this at every step.

"Now that the ruling has come down in our favour, the politicians are talking about how much this is going to cost the taxpayer," she adds.



A woman's place table with columns for CANADA and WORLD, rows for MPs, Administrators and managers, Professional and technical workers, Share of earned income, Adult literacy, Educational enrolment, Life expectancy.

Table with 2 columns: CANADA, WORLD. Rows: MPs (19%, 13%), Administrators and managers (42%, 14%), Professional and technical workers (56%, 39%), Share of earned income (38%, 30%), Adult literacy (99%, 70%), Educational enrolment (100%, 57%), Life expectancy (81.7 years, 65.4 years).

ration, which have until now resisted pay equity complaints by employees, could be forced to pay up or face penalties. Legislators across Canada are waiting for the federal government's response. After the new ruling, there is growing awareness that, in the long run, stalling may cost governments a lot more.

The writer is a journalist with the Canadian Broadcasting Corporation.

Rainwater Reservoir: Lean Days' Server

by Aminul Islam

WATER is the most common substance on earth covering more than 70 per cent of the planet's surface.

Even today, in the age of revolutionary development of science and technology, water is given the highest importance. Water is the source of life and no living being in the universe can do even a moment without water.

But the total amount of water in the world is fixed and has a volume of some 326,000,000 cubic metres, or 1,100,000,000,000 acre feet.

Distribution of Liquid Fresh Water table with columns: Location, Cubic metre, Percentage. Rows: Groundwater (2,000,000, 97.74), Lake water (30,000, 1.47), Surface water (16,000, 0.78), River and stream water (300, 0.01).

Water sources may be classified as either surface water or ground water. Both groundwater and surface water sources are used for community water supplies.

But then the problem is, there are places where the supply of groundwater is not adequate, or somehow the ground water available is contaminated.

People of the remote villages of the coastal districts of the country like Khulna, Satkhira were looking for alternative arrangement to meet their demands of pure drinking water.

Rainwater Harvesting System is one of the devices NGOF had developed in the coastal ar-



Azibur Rahman's Rain water Harvesting Plant

ea to ensure round-the-year pure drinking water supply facilities. But applying this system, people can easily store rain water for using as pure drinking water.

The NGO started the project in early 1997 in remote villages of Satkhira and Khulna districts and so far it has installed some 34 Rainwater Harvesting Plants there.

Azibur Rahman, a mason by profession, installed a plant in the yard of his house in 1997. Srikalaskhathi, the name of his village, is an underdeveloped area in any sense.

Diarrhoea was a common phenomenon in the village. But the situation began to change gradually from 1997.

some Tk 7000 for the completion of the total plant which he shares with another family. As Azibur himself is a mason, he did not have to pay for the construction of the plant.

"We are about 15 people in two families," Azibur said, adding, "the tank serves us the whole rainy season, and the water that we store in the rainy season can serve us the whole dry season (five months) — by supplying pure drinking water."

The water stored in the tank is pure sweet water. A superstitious believe has developed in the locality that the water of my tank cures stomach ache. Any person who feels stomach ache just rushes to my home and takes some water from the tank," Azibur said.

As the days pass on, the system is gaining popularity in the coastal areas of Khulna and

Satkhira. People with minimum technical know-how can construct and operate a plant.

Using rain water as the source of pure drinking water supply is not new at all. It had been there in Egypt where rain water was first stored for using as drinking water.

The people in the coastal areas of Bangladesh also began using rainwater long ago.

It has been estimated that a tank of 3200 litre capacity can serve a 12-member family for the full dry season (five months).

People of the areas feel that more Rain Water Harvesting Plants and PSFs should be installed in their localities to ensure year round supply of pure drinking water.

TOM & JERRY

By Hanna-Barbera

Comic strip panel: TOM & JERRY. I'M TIRED OF WATCHING OLD MOUSE CARTOONS. CLICK CLICK CLICK. DIST. BY ARBA FEATURES

Comic strip panel: James Bond. STILL PINGING... OFF THE PORT BOW. HER HYDROPHONE'S SILENT... NO PROPELLOR SOUNDS BEING TRANSMITTED... MUST BE A WHALE OR SQUID. GENTLEMEN, SEA SLAVE HAS DETECTED SOMETHING ON ASDIC - WHAT YOU AMERICANS CALL 'SONAR'.

Comic strip panel: UNCLE, JERRY WHAT'S THAT THING? THE BATTERY FROM THE REMOTE.

Comic strip panel: THE 'WHALE', TOO, HAS ELECTRONIC EARS! JAWWOW! THE U-BOAT IS COMING - CAPTURE HER SCREWS!