



## **Domestic desalination of water**

*Felix Ryan, India*

DUE TO INCREASE in population and climatic changes in many parts of the world, the water table has fallen below 150 feet and energised bore pumps are reducing the level further. In most places bore water contains poisonous Selenium and/or Arsenic, as for example, in the city of Madras, making water unfit for human consumption as per WHO standard.

Centralised water storing and distribution in pipelines does not reach adequate water to the unreached. Scanty rains, deforestation, internal conflicts, interstate politics, terrorism and sabotage are some of the reasons for this state of affairs. Therefore, every country, region, town, village and home must make its own water storing and drawing arrangements. Domestic and community scale desalination is the answer.

Governments should provide a network of man made sea water canals and streams for people to desalinate sea water using mud pots. It has been demonstrated that steam from the rice pot, for instance, is easily tapped to convert 3 bottles of sea water into 2 bottles of potable water (details of this process are available with the author). This principle can be used on a commercial scale to cultivate fields and to supply hotels and hostels, farms and factories.

Wind, wave and solar energy must be combined to desalinate sea water as done in Saudi Arabia. Transportation and pipelines should be avoided. Saline agriculture out of sea water should be encouraged as in Israel or Arizona. Solar ponds and man made lagoons must be promoted.

### **Sea water for eradicating poverty**

The Copenhagen commitments (at the World Summit for Social Development) marked a significant advance. They speak of the "eradication" and not just the "alleviation of poverty".

While globalization has benefitted societies in many ways, extreme poverty, homelessness and the creation of a burgeoning "underclass"—unemployed youth with no prospect or hope for the future, continue to stand out glaringly as one of the greatest challenges of our time.

However, all these problems can be solved by digging sea water canals, not only for transporting goods and people, but also for promoting fish, saline agriculture, and for producing innumerable varieties of raw materials needed for Village and Cottage industries.

This will also open up enormous opportunities for domestic desalination and a saline agriculture programme.

Hundreds and thousands of sea-water plants, weeds, trees and reeds have now been identified and widely publicized. They need only to be launched and harvested for human welfare.

A new set of tools are required now because the old ones have just failed to work anymore. The wrong illusion that, sooner or later, the benefit of centralised development will flood down to the poor and the remote corners of the world should be abandoned forthwith. Instead, a model of development based on people's resourcefulness and ingenuity to achieve efficiency and social equity should be seriously followed and encouraged. Poverty cannot be eradicated without economic growth and economic growth cannot be brought about if millions are still enslaved in poverty. We cannot afford to risk another decade of stagnation through inaction.

The urban population of the world has tripled since 1950, according to the 1988 State of the World Population Report. Big cities are criminally responsible for both liberal consumption of resources, and production and accumulation of mountains of waste. Tragically, uncontrolled growth threatens to explode present transport, health and sanitation systems in many countries.

Ten of the world's twelve largest cities identified will be in developing countries by the year 2000 A.D. They are Mexico, Sao Paulo, Calcutta, Rio De Janeiro, greater Bombay (now Mumbai), Jakarta, Delhi, Bangkok, Dacca and Buenos Aires.

But, there is not enough water to go round, and the water shortage phenomena is repeating itself in country after country, from the slums of Mexico to the overburdened farms of China, from the irrigated desert of the American South-West to the dead shores of the once vibrant Areal sea. In many advanced countries the water shortage is crippling.

The Areal Sea, once the fourth largest lake in the world, has shrunk in size by half, and its salinity has tripled since 1960s — largely because the incoming water from feeder rivers was diverted to irrigate cotton and rice crops of dubious benefit.

We are not only outstripping the precariously limited freshwater stock of our planet, but also poisoning the scarce and fast depleting water resources that sustain all life.

As has been pointed out, "To comfortably ensure the availability of fresh water on a progressively sustainable basis, the whole question of the water cycle, the quality and quantity of water, has to be looked at, from an ecosystems and cross-sectoral approach".

## Consequences of pollution

The amount of polluted waste water discharge in the world is expected to double between 1980 and the year 2000, whereas the global need for water doubles once in 21 years.

To add to the problem of shortage, it is reported by the International Water and Sanitation Centre of Netherlands that 2 million tons of human excreta alarmingly pollutes the rivers and ground water of our planet every day.

For instance, in Latin America, about 98 per cent sewage water is discharged untreated. In China two thirds of the rivers are dangerously polluted. Three quarters of the rivers in Poland are so contaminated, that the water cannot be used for industry or agriculture, not to speak of human consumption.

40 rivers in Malaysia are devoid of fish and other aquatic life due to high pollution, 60 to 70 percent of the water that flows through the Passing river in Manila, Philippines, carries large amounts of untreated sewage.

Despite these dreadful facts highlighted, not even half the number of projects financed and backed by the World Bank include a sanitation component.

The potential for epidemics and waterborne diseases is now dangerously high, just as it was in nineteenth century Europe, when measures to protect water supplies from human pollution were taken ONLY after cholera threatened to decimate the rich and poor alike.

## Poor state of water systems

It is estimated that about 30 to 40 percent of water systems in developing countries are broken at any one time, and that a third or more of piped water in towns and cities is lost before it ever reaches the tap.

The United Nations Children's Fund (UNICEF) reports that one third of the funds spent at the end of 1980s were destined to keeping existing schemes going in the Gorkh district of Nepal. Save the Children reports that 80 percent of taps in a rural piped water system became dry two years after installation, because of broken pipelines and sediments in the tanks.

The tragedy of the project in Nepal is an eye opener in that when the taps stopped working, the villagers just shrugged, and went back to their old water sources. What a colossal waste of money and effort!

## The rationale for drawing sea water

If the lessons learnt during the International Drinking Water and Sanitation Decade are ignored, the crisis may be unavoidable. If untreated water flow continues to run through our cities and towns, carrying the risk of communicable diseases, it could affect millions of lives.

There would not be enough potable water for everyone, nor would there be adequate food. Millions could starve. Wars over water rights would erupt, exacerbating all the conflicts already plaguing the world.

However, if the bitter lessons of 1980s were taken into serious consideration by planners and policy makers at the local and global levels, we can escape the impending crisis.

The more easily accessible supplies of water have already been exploited, and depleted, and tapping new sources and transporting water costs too much. The treatment of water to acceptable standards and delivering them in pipelines to the vast majority of masses will cost several billion dollars. Therefore, the most practicable and viable policy will be to draw water from the sea in open unpaved canals, as is now being done, in the Gulf and desert countries.

If governments are incapable of providing treated clean water to the masses and millions of people, they should at least make available to them sea water for their survival. Certainly, sea water is better than no water and can be easily and inexpensively desalinated by the rural poor.

Jordan finds it very difficult to supply water for her people due to a general lack of water resources in the country. It is basically an arid country with very few aquifers and very little groundwater.

Due to this, drilling deep wells has adverse effects on the quality of water and duration of its yield, and on the environment. In spite of this acute problem, Jordan is supplying healthy potable water for over 80 percent of the people for domestic use, agriculture and industry by exploiting the sea, and remarkably, at a much lower price than many other countries in the world that sell water to their people. Access to safe water is a human right. Why should one pay for one's human right?

Today, 80 percent of the water used in Saudi Arabia is drawn from the sea and 50 percent in Dubai is drawn for the sea. Israel spectacularly leads the world in saline agriculture. Its exports of large quantities of fruits and vegetables to Europe are cultivated in the desert sands, by drawing an eternal supply of sea water in many forms.

Israel produces electricity in solar ponds and uses that power to desalinate sea water. Tata Energy Research Institute (TERI) has successfully demonstrated this method in India. Are they not sufficient testimony to inspire and motivate others?

And yet, many water starved countries of the world do not get sufficiently inspired by the lead and example of countries which use sea water, but keep digging vainly, deeper and deeper into dead mother earth for water.