

Water is life, we are told, for people and the planet. Water is essential to human well-being, a vital input to economic development and a basic requirement for the healthy functioning of all the world's ecosystems. Clean water is essential for human health and survival, and also critical to other aspects of sustainable development

such as environmental protection and food security. Target 10 of MDG 7 proposes to halve the number of people without sustainable access to safe drinking water and basic sanitation. This target is also crucial for meeting most of the goals such as eradicating poverty, improving material health and combating major diseases.

## India: soft drinks, hard cases

By Vandana Shiva and translated by Donald Hounam

The Indian government forced Coca-Cola out of the country in 1977. The company's return, in October 1993, coincided with the arrival of its arch-rival Pepsi. The United States multinationals now own 90 factories in India: Coca-Cola 52 and Pepsi 38. They describe these as bottling plants; actually they are pumping stations, each of which extracts up to 1.5m litres of water a day from the ground. It takes nine litres of clean water to manufacture a litre of Coke.

The processes used in manufacturing these soft drinks are inherently damaging. The extraction of groundwater deprives poor people of their fundamental right of access to clean water. The factories spew out toxic waste that threatens health and the environment. And the products themselves are harmful — the Indian parliament has set up a joint committee to inquire into the presence of pesticide residues.

In March 2000 Coca-Cola opened a plant at Plachimada, a village in the Palakkad district of the southern state of Kerala, intended to produce 1.2m bottles of Coca-Cola, Fanta, Sprite, Limca, Thums Up, Kinley Soda and Maaza every day. The conditional licence granted by the local panchayat (village council) authorised the use of motorised pumps, but the company drilled more than six wells and illegally installed high-powered electric pumps to extract millions of litres of pure water. The level of the water table fell from 45 to 150 metres below the surface.

Coca-Cola then polluted what little water it had not stolen from the community. It started by dumping waste outside its premises. During the rainy season, this spread into paddy fields, canals and wells, causing a serious health hazard. The company abandoned this practice and began pumping dirty water into dry boreholes that had been drilled on-site for the disposal of solid waste. This contaminated the aquifers.

As the water supply deteriorated, the local *adivasi* women had to travel about 5km to fetch drinkable water. A journalist at the daily newspaper Mathrubhumi, Virender Kumar, pointed out that during the time this took them, soft drinks would come out of the plant by the truck-load<sup>3</sup>. The women organised a dharna (sit-in) outside the factory gates to protest against the depletion of the groundwater.

Because of Coca-Cola's activities, 260 wells — sunk by the authorities to supply drinking water and meet irrigation needs — have run dry. This part of Kerala is known as the rice bowl but agricultural yields have plummeted. Worse, Coca-Cola has been distributing the toxic waste from its factory to the villagers as free fertiliser. Analysis has shown that this sludge is rich in cadmium and lead, both carcinogenic.

Tribal and farming representatives have protested about the serious damage to harvests caused by contamination of aquifers and springs, and by indiscriminate drilling. They have particularly called for measures to protect traditional sources of drinking water, preserve ponds and water tanks, and maintain navigable waterways and canals.

When Coca-Cola refused to account for its practices, the panchayat withdrew its operating licence. It has been alleged that the company responded by offering the council's president, Anil Krishnan, a 300m rupee bribe (\$6.8m), which he refused. But the loss of the licence did not cost them the support of the state

government, which awarded Coca-Cola a subsidy of 2m rupees under its regional industrial policy. Pepsi and Coca-Cola have secured similar grants in all the Indian states where they have set up factories, although their products have negligible nutritional value compared with traditional drinks such as *nimbu pani, lassi, panna* and *sattu*.

Nor does the damage inflicted upon the food chain and the economy stop here. To sweeten its products, the soft drinks industry increasingly uses maize syrup, high in fructose and damaging to health. Since maize is already used in the industrial manufacture of animal feed, this significantly reduces the amount available for human consumption, depriving the poor of a cheap, basic food. The substitution of maize-derived sweeteners for healthier equivalents derived from sugar cane (such as gur and khandasari) has an adverse effect upon farmers, whose subsistence depends on cane crops.

In 2003 the district medical officer advised the people of Plachimada that their water was so polluted that it was unfit for consumption. The *adivasi* women were the first to denounce Coca-Cola's hydro-piracy with their sit-in. Their initiative sparked national and international expressions of solidarity. In February 2004, as the campaign gathered strength and with a drought worsening the water crisis, Kerala's chief minister finally ordered the closure of the Coca-Cola plant. The entire Plachimada panchayat joined the rainbow alliance created by the women. Another panchayat, in Perumatty, filed a public-interest suit against the multinational in the Kerala high court.

In December 2003 Justice Balakrishna Nair ordered Coca-Cola to cease illegal extraction of groundwater in Plachimada. The reasons for his judgment are as significant as the decision. He pointed out: "The public trust doctrine primarily rests on the principle that certain resources like air, sea waters and the forests have such a great importance to the people as a whole that it would be wholly unjustified to make them a subject of private ownership. The said resources being a gift of nature, they should be made freely available to everyone, irrespective of their status in life. The doctrine enjoins upon the government to protect the resources

for the enjoyment of the general public rather than to permit their use for private ownership or commercial purpose.

"Our legal system, based on English common law, includes the public-trust doctrine as part of its jurisprudence. The state is the trustee of all natural resources, which are by nature meant for public use and enjoyment. The public at large is the beneficiary of the seashore, running waters, air, forests and ecologically fragile lands. The state as a trustee is under a legal duty to protect natural resources. These resources meant for public use cannot be converted into private ownership.

"Water is a public good; and since the state and its various agencies are under an obligation to protect groundwater against excessive exploitation, their inaction constitutes a violation of the right to life guaranteed under Article 21 of the Indian constitution.

"The Supreme Court of India has consistently maintained that the right to unpolluted air and water are an integral aspect of the right to life as defined by this article. So although there is no law specifically regulating the extraction of groundwater, the panchayat and the state are required to prevent any over-exploitation of underground reserves. Coca-Cola's property rights do not extend to the ground water below the land it owns. Nobody has the right to appropriate the lion's share of this resource and the government has no power to licence a private third party to extract water in such vast quantities."

Accordingly, the court gave Coca-Cola a month to cease water-extraction; and it ordered the panchayat and the state to ensure that this demand was met.

The women have been the heart and soul of the resistance and their initiative has been taken up by lawyers, parliamentarians, scientists and writers. The struggle has spread to other areas where Coca-Cola and Pepsi are pumping out aquifers. Following the opening in 1999 of a Coca-Cola plant at Kaladera, a village near Jaipur, the capital of the state of Rajasthan, the water table level below ground fell from 12 to 37.5 metres. The opening of a factory in the Mehdiganj district, 20km

from the holy city of Varanasi (Benares), caused groundwater to sink by 12 metres and polluted surrounding fields. A Coca-Cola installation at Singhancher, a village in the Ballia district of eastern Uttar Pradesh, has caused long-term pollution to water and land.

Everywhere, protesters are organising. But the public authorities' usual response to demonstrations has been violence. At Jaipur, in October 2004, the well-known Gandhian activist Siddharaj Doda was arrested for taking part in a peaceful march to demand the closure of the factory.

It is not only the drying-up of the wells; it is also the risk of contamination. When, despite evidence that their products contained pesticides that represent a danger to health<sup>4</sup>, both companies refused to produce a list of ingredients, the Rajasthan high court banned the sale of drinks manufactured by Coke and Pepsi. The supreme court rejected an appeal and demanded disclosure of the exact contents of the products. So far, the drinks remain banned throughout the state.

A 1999 study by the All India Coordinated Research Project on pesticide residues showed that 60% of food products sold in the country were contaminated with pesticides and that 14% contained residues above permitted levels. Facts like these give the lie to the myth that multinationals are primarily concerned with safety and more trustworthy than the public sector. This prejudice against the public provision of goods and services has helped sell the idea of privatisation, which has undermined the supply of clean water at an affordable price.

On 20 January human chains formed around Coca-Cola and Pepsi factories across India. People's tribunals gave the hydro-pirates notice to quit the country. The Plachimada case proves that people are more powerful than private companies.

Such pillaging of water resources could not happen without the complicity of centralising states. Campaigns have expanded to encompass dam projects and the grandiose plan to divert all the subcontinent's rivers from their courses, which is increasingly opposed<sup>4</sup>. Protest-



ers have denounced the privatisations encouraged by the World Bank, specifically that of the Delhi water supply<sup>5</sup>.

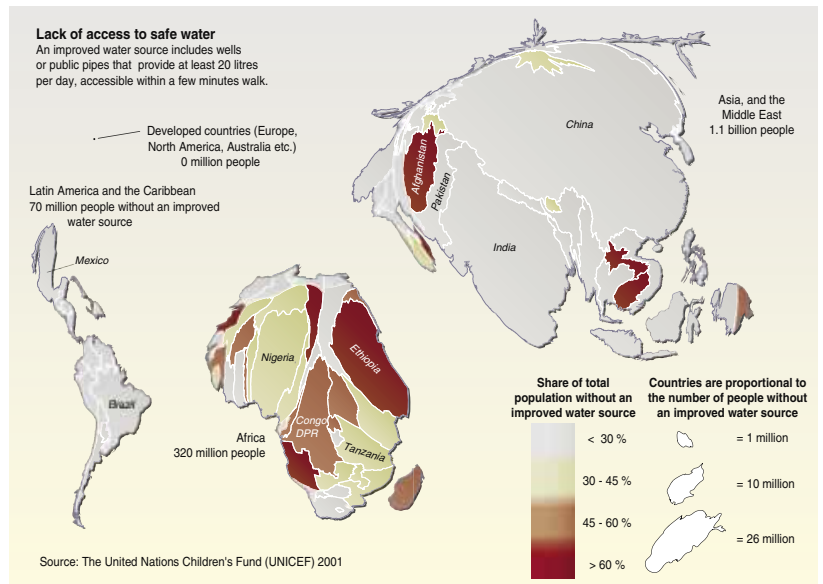
The struggle against the theft of water is not limited to India. Overexploitation of groundwater and major river diversion projects represent a significant threat to the world as a whole. Nature does not distribute water uniformly. If every part of the globe received equal rainfall, with the same frequency and pattern, the same vegetation would spring up everywhere, supporting the same animal species. Our world is built upon diversity; its hydrological cycle is a democratic system for the distribution of water to all living species. Without democratic access to water, there can be no democracy.

1. *Adivasi* denotes indigenous tribes, outside the caste system.
2. Virender Kumar, open letter to the chief minister, Mathrubhumi, Thiruvananthapuram (Kerala), 10 March 2003.
3. Studies showed that the beverages contained pesticides. The government commission concluded that these residues fell within the normal limits permitted in India. Coca-Cola consumed in the US contains no trace of pesticides.
4. See Arundhati Roy, *The Cost of Living*, Modern Library, New York, 1999.
5. Water treatment has been entrusted to Degremont, a subsidiary of France's Suez group. In recent years, the price of water in Delhi has risen 10-fold.

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Dhaka, Bangladesh: Nine year old Rashida Munshi washes herself after she has been working from 06.00 to 19.30 opening used batteries to recover the coil. There are no bathroom facilities. She has to wash in public waters which people also use as toilet. Being a girl she cannot take off her clothes to clean more properly. She is paid by amount. 100 batteries pay 2 Taka and she does about 500 batteries a day. Rashida makes about 280 Taka a month. The money goes to her mother who pays 450 Taka per month rent for their shack. Father doesn't work. He doesn't feel too well. July 1999. © Michel Szulc-Krzyzanowski / The Image Works.



Source: The United Nations Children's Fund (UNICEF) 2001

# Water-for-food and sanitation solutions

By the **Communications Division** of the **Stockholm Environment Institute**

Sanitation, health, water, food and ecosystems are closely interrelated. According to the Water and Sanitation Task Force, 42% of the world's population – 2.6 billion people – defecate in the open. A lack of basic sanitation services – defined by the WHO as the connection to a public sewer or septic system or access to a pour-flush latrine, simple pit latrine or ventilated improved pit latrine – undermines the health of men, women and, particularly, children. To meet the Millennium Development Goal (MDG) for sanitation, some 450m additional households will require services by 2015; 60% of these are in urban areas. A recent Stockholm Environment Institute (SEI) study<sup>1</sup> indicates that the MDG urban sanitation target will not be met through conventional water treatment alone, due to prohibitive costs and infrastructure requirements. One alternative for rural and urban areas is "eco-sanitation", including dry toilets that use urine diversion and faecal sanitization and the composting and recycling of nutrients for agricultural use. "Eco-toilets" are an affordable, feasible option that may be scaled up for use in larger communities. Eco-sanitation systems have already been successful in China in both rural and urban areas, and in Vietnam, South Africa, Mexico and El Salvador, to name a few.

Ecological sanitation can meet a significant proportion of fertiliser needs while helping to improve the capacity of the soil to hold water. In sub-Saharan Africa adopting this approach could replace almost all the commercial fertilisers currently used that are based on fossil fuels and finite resources.

However boosting soil nutrient levels is not the only way of eradicating global hunger. To produce enough food to halve the world's undernourished population by 2015, fresh water consumption will need to increase by 50%. Producing food uses more water than any other human activity. It takes 4,000 litres of fresh water per day to provide food for just one person. This adds up to 1,300 cubic metres per person per year. Some countries, such as India, Kenya and Nigeria, would have to double current fresh water use, even after the benefits of crop-per-drop (increased

yield through more efficient use of water) improvements are factored in.

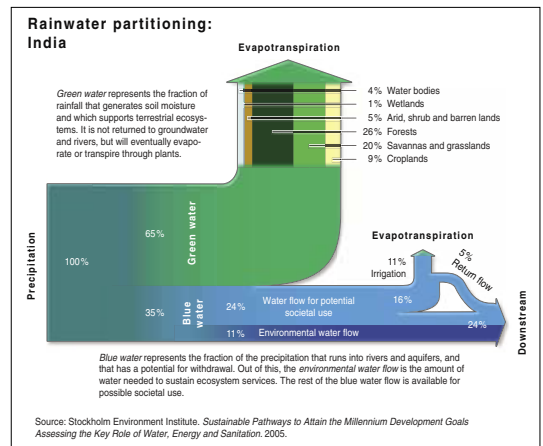
While irrigation will continue to be important, it does present limitations and cannot solve the problem alone. The emphasis must be placed on crop-per-drop improvements targeting rain-fed agriculture. We will need improved land management practices that increase the soil's water content. The necessary techniques are available, though new and not yet widespread.

There is a strong correlation between poverty, hunger and unreliable rainfall. This is a major challenge to researchers and policy makers. The countries most seriously affected by these issues also face the highest risk of water scarcity, huge variations in rainfall and frequent droughts and flooding. The need for more water for food production will result in trade-offs with human use down-

stream and other terrestrial and aquatic ecosystems. Major increases in the use of fresh water for food production in the near future will require joint efforts to balance the needs of humans and nature. Moreover to reduce world hunger by 50% over the next 10 years, 1.2 m sq km of land will need to be converted to rain-fed agriculture from other uses.

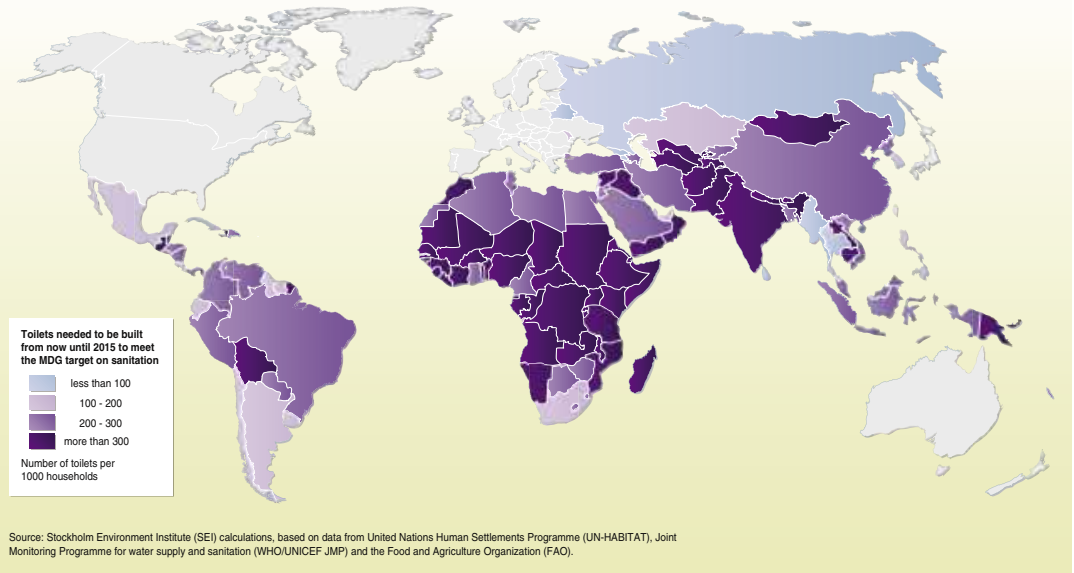
With clear links between the issues of water, sanitation, health, poverty and hunger, there is an urgent need to find intelligent integrated strategies for managing fresh water, land use and sanitation.

1. See [www.sei.se](http://www.sei.se) for downloadable version of the report "Sustainable Pathways to Attain the Millennium Development Goals: Assessing the Key Role of Water, Energy and Sanitation", Stockholm Environment Institute (2005).



India is facing a food supply challenge with more than one billion inhabitants, and out of them 35% below the poverty line. This analysis of the rainwater partitioning shows that there is room for India to use more water than the current status, to increase food production, and ultimately reduce poverty (MDG1) – while still retaining healthy aquatic ecosystems (1% of the rainwater needed for MDG1). A similar analysis conducted for Kenya show, for instance, much more narrow margins.

## Number of toilets needed to meet the sanitation target by 2015: To halve the proportion of people without sustainable access to sanitation



# Turning urban waste water to wealth

By **Liqia Raschid-Sally**, Senior Researcher at the **International Water Management Institute**



Goal 7

Poverty is often synonymous with a poor water supply, a lack of sanitation services, environmental degradation and poor health. Improving the water supply raises the issue of how to deal with waste water, 70% of which is channelled back into systems largely untreated. In many places untreated waste water is discharged into the nearest stream. Cities in the developing world have few resources to invest in waste water management. The results can be seen in waterways such as the Musi River in Hyderabad, India, the tributaries of the Red River in Hanoi, Vietnam, and irrigation canals in Pakistan and Central Asia, which are virtual open sewers.

Many poor farmers depend on waste water for their livelihoods, it often being the only water available. Occasionally farmers actually prefer such water for irrigation, as the nutrients it contains allow them to save on fertiliser. In Haroonabad, Pakistan, farm-

ers on an irrigation-canal system sold their fresh water rights, bought waste water from the municipality and channelled it through the existing irrigation system to their plots. They saved fresh water and were more productive than farmers using conventional irrigation (gross profit margins of \$840 per hectare compared with \$614 per hectare). This was largely due to the year-round availability of waste water, which allowed for multiple growing seasons, as well as the additional nutrients it contained. In Ghana, farmers in urban and peri-urban areas use polluted water to irrigate vegetable plots and earn annual incomes ranging from \$600 to \$5,000 per hectare, lifting them above the poverty line. In India, along the banks of the Musi River, waste water is considered "black gold" to the 51,000 direct and indirect users who depend on it for their livelihoods.

However, there is a downside to this practice. The use of waste water for irrigation poses a threat to human health and the environment. The major threat to farmers and their families is from intestinal

parasites – most often worms. It may also contain highly poisonous chemical toxins from industrial sources, including heavy metals, active hormones and antibiotics. The risks associated with these substances may, in the long run, pose a greater threat to public health than the risks associated with excreted pathogens<sup>1</sup>. However, from the farmers' perspective, earnings from agriculture provide access to health care, nutrition and education. In the absence of any alternative, they are willing to live with the risk. But do they really have a choice?

There is a further dimension to the issue. The long-term use of waste water may also damage the soil under some conditions leading to soil logging and salinisation, with eventual loss of productivity and damage to crops.

The environment may also be a source of solutions, however. Down the Musi River, water quality has improved because runoff from irrigated fields is cleaner than the waste water initially used to irrigate. The land can assimilate more waste than

streams and ponds and, if designed properly, the system can be made sustainable at a lower cost. This is a clear improvement on the current disposal practice of dumping untreated waste water directly into streams.

These experiences suggest that we need to explore land use as a potential "sink" for waste water. A balance must be struck between the economic survival of families, and potential health risks to farmers and consumers and environmental degradation. This will require working in collaboration with policy makers, health experts, engineers and land-use planners.

1. Scott, CA; Faruqui, N. I.; Raschid-Sally, L. 2004. "Wastewater use in irrigated agriculture: Management challenges in developing countries" in Scott CA, Faruqui NI, Raschid-Sally L. (eds.) Wastewater Use in Irrigated Agriculture: Confronting the Livelihood and Environmental Realities, Commonwealth Agricultural Bureau International, Orient-Longman, and International Development Research Centre, Ottawa, Canada.