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Editorial / Opinion

Turning Scarcity Into Abundance

By Vandana Shiva

Water has grown scarcer in India, as the Green Revolution's water-guzzling agriculture replaces traditional practices attuned to local water conditions and local needs. Now indigenous water conservation know-how is bringing back sufficiency - and even abundance.

Water abundance I have witnessed the conversion of my land from a water-abundant country to a water-stressed country. I saw the last perennial stream in my valley run dry in 1982 because of the mining of aquifers in catchments. I have seen tanks and streams dry up on the Deccan plateau as eucalyptus monocultures spread. In case after case, the story of water scarcity has been a story of greed, careless technologies and taking more than nature can replenish and clean. Over the past two decades, I have witnessed conflicts over development and natural resources mutate into communal conflicts, culminating in extremism and terrorism.

The water cycle connects us all, and from water we can learn the path of peace and the way of freedom. We can learn how to transcend water wars created by greed, waste and injustice, which create scarcity in our water-abundant planet. We can work with the water cycle to reclaim water abundance. We can work together to create water democracies. And if we build democracy, we will build peace.

Since the 1950s, the Green Revolution has been hailed for its success in expanding the global food supply, particularly in developing nations such as India and China. High-yield miracle seeds were promoted all over the developing world, and the Green Revolution was praised for preventing the starvation of millions of people. The ecological and social costs of the Green Revolution were largely ignored. Through its emphasis on high-yield seeds, this agricultural model replaced drought-resistant local crop varieties with water-guzzling crops. The Green Revolution led to water drawing down aquifers in water-scarce areas.

In the Deccan area of south India, sorghum was traditionally intercropped with pulses and oilseeds to reduce evaporation. The Green Revolution replaced this indigenous agriculture with monocultures. Dwarf varieties replaced tall ones, chemical fertilisers took the place of organic ones, and irrigation displaced rain-fed cropping. As a result, soils were deprived of vital organic material, and soil moisture droughts became recurrent.

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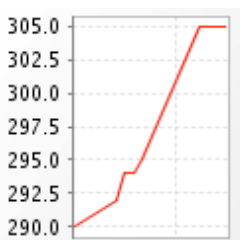
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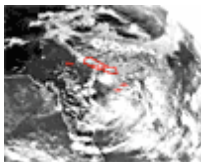
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In drought-prone regions, ecologically sound agricultural systems are the only way to produce sustainable food. One acre of rice uses as much water as three acres of sorghum. For the same amount of water, sorghum provides 4.5 times more protein, four times more minerals, 7.5 times more calcium, and 5.6 times more iron, and can yield three times more food than rice. Had development taken water conservation into account, sorghum and millet would not have been called marginal or inferior crops.

Prior to the Green Revolution, groundwater was accessed through protective, indigenous irrigation technologies, which relied on renewable human or animal energy. These were identified as "inefficient" and were replaced by oil engines and electric pumps that extracted water faster than nature's cycles could replenish it.

Water is available only if water sources are regenerated and used within limits of renewability. When development philosophy erodes community control and instead promotes technologies that violate the water cycle, scarcity is inevitable.

Since the 1990s, the World Bank and other aid agencies have been aggressively pushing privatisation and market-based distribution of water. The result has been an accelerated extraction of groundwater.

Across India, wells powered by fossil fuels and electricity have mushroomed as part of an informal privatisation of groundwater. After the 1972 drought in Maharashtra, the World Bank heavily subsidised and mechanised water withdrawal systems. The Bank also gave credit for tube wells that were to feed commercial irrigation and reduce water scarcity. The result was an explosion of sugarcane cultivation. In less than a decade, sugarcane cultivation converted groundwater into a commodity and left people and staple food crops thirsting for water. While sugarcane is cultivated on only 3 per cent of Maharashtra's irrigated land, it consumes 80 percent of the irrigation water and eight times more water than other irrigated crops.

Although the shift from rainfed, coarse-grain production to a water-hungry cash crop has increased average household income, the costs have been great. In Manerajree village, for example, a new water scheme with a potential supply of 50,000 litres was commissioned in November 1981 at a cost of \$14,000. The water supply lasted only one year. Since 1983, continuous tanker service provides water to the area.

Everyone agrees that the world is facing a severe water crisis. There are, however, two conflicting paradigms for explaining the water crisis: the market paradigm and the ecological paradigm. According to the market paradigm, if water could be moved and distributed freely through free markets, it would be transferred to regions of scarcity, and higher prices would lead to conservation. As Terry Anderson and Pamela Snyder state in *Water Markets*, "At higher prices people tend to consume less of a commodity and search for alternative means of achieving their desired ends. Water is no exception."

Such abstract arguments miss the most crucial point - when water disappears, there is no alternative. For Third World women, water scarcity means travelling longer distances in search of water. For peasants, it means starvation and destitution as drought wipes out their crops.

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The water crisis is an ecological crisis with commercial causes but no market solutions. Higher prices under free-market conditions will not lead to conservation. Given the tremendous economic inequalities, there is a great possibility that the economically powerful will waste water while the poor will pay the price. Market solutions destroy the earth and aggravate inequality. The solution to an ecological crisis is ecological, and the solution for injustice is democracy.

Scarcity and abundance are not nature-given - they are products of water cultures. Cultures that waste water or destroy the fragile web of the water cycle create scarcity even under conditions of abundance. Those that save every drop can create abundance out of scarcity. Indigenous cultures and local communities have excelled in water conservation technologies. Today, ancient water technologies are once again gaining popularity.

There are more than 25 types of irrigation and drinking water systems built by the diverse communities of India. To this day, these ancient systems are the mainstay of survival in ecologically fragile zones. In pre-British India, irrigation systems were managed by social organisations within villages.

The British, whose agricultural system did not depend on irrigation, had no knowledge of water management when they arrived in India. Indifference to and ignorance about local ecological conditions led to the failure of many engineering projects during British rule. After 30 years of disastrous efforts to restore the Grand Anicut dam on the Kaveri River, Sir Arthur Cotton, the founder of colonial irrigation programs, reverted to the more effective indigenous methods.

While water privatisation is the preferred policy by governments and global financial institutions, masses of people across India and around the world are mobilising to conserve water and regain community control over their resources. The Pani Panchayat movement, launched by the NGO Gram Gaurav Pratisthan (GGP), for example, aims to create an equitable and ecologically sustainable water system in a drought-prone area.

The movement began in 1972, after Maharashtra's severe drought. While the government focused on famine relief and continued to rapidly exploit water resources, GGP founder Vikas Salunke recognised strict water control and soil conservation as the most effective tools to survive the drought.

Movements for water conservation are spreading all over India. In Gujarat, where nearly 13,000 villages have no dependable source of water and where groundwater is saline, women members of water councils are taking the lead in creating water-harvesting systems. The people's investment in water conservation has also helped recharge groundwater, fill rivers and increase crop production. In 1994, the Arvari River came back to life after being recharged by 500 johads, the traditional earthen check dams that catch the monsoon rains and hold the water through the dry season.

Common resource Man-made water scarcity and ubiquitous water conflicts can be minimised with the recognition of water as a common resource. Water conservation movements are also showing that the real solution to the water crisis lies in people's energy, labour, time, care and solidarity. The current war against water scarcity can be won only through massive movements for water democracy. People's movements have shown the possibility of creating abundance out of scarcity.

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