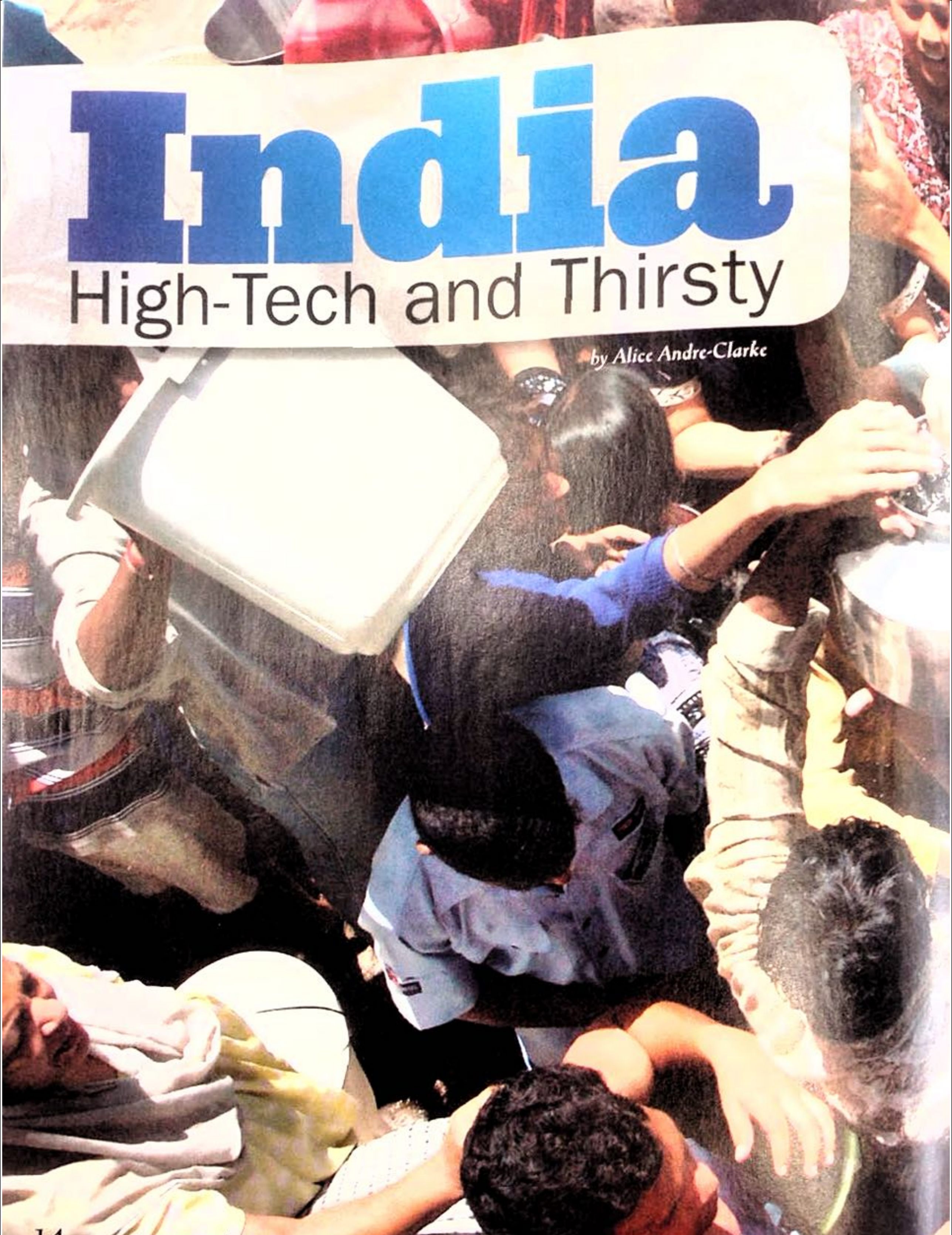
India

High-Tech and Thirsty

by Alice Andre-Clarke



People rush toward a water tanker to get their share at Parel, Mumbai, Maharashtra, India.

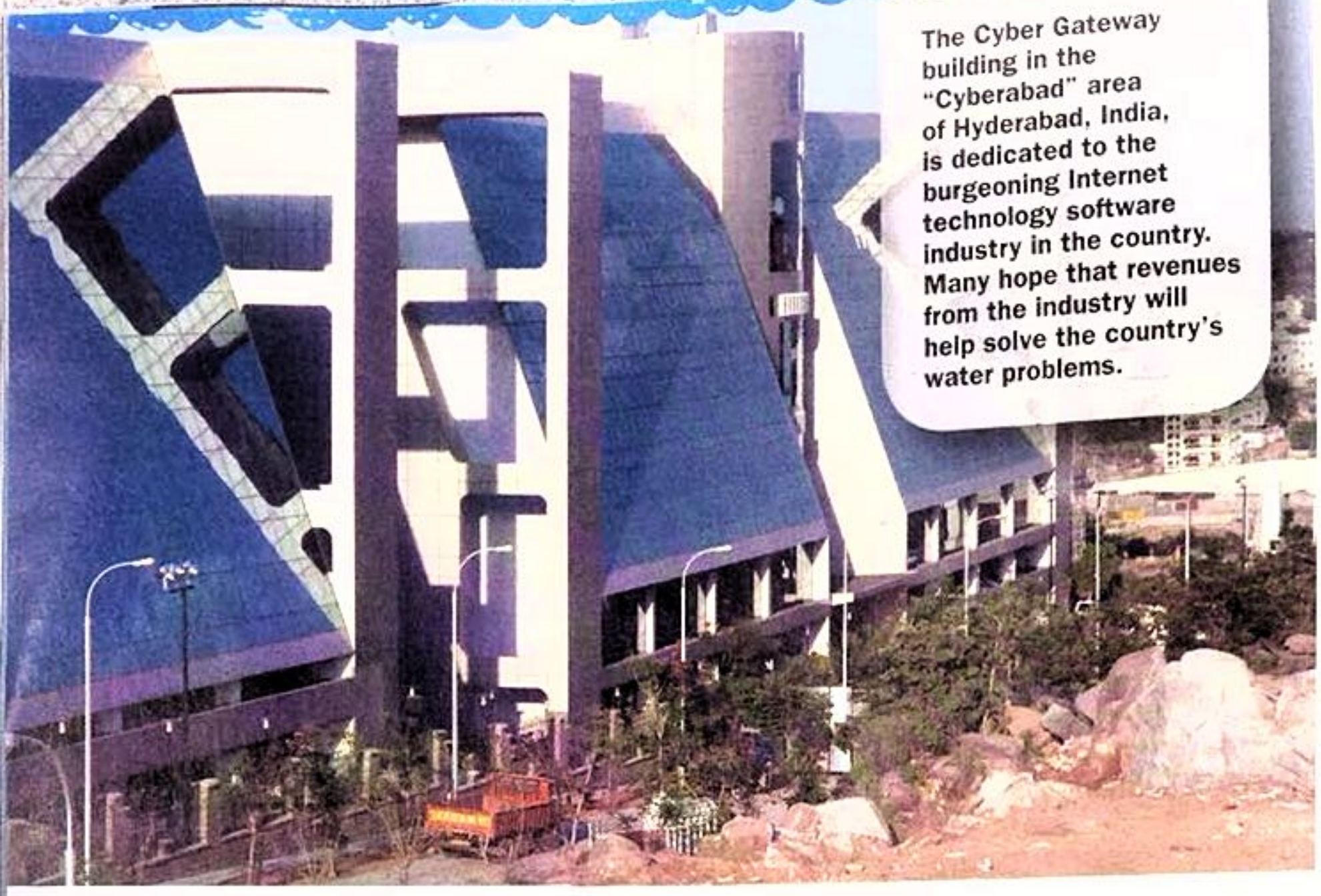
When U.S. companies need great software engineers and data managers, they turn to India more than to any other country. When an American computer scientist wanted to develop the best handwriting recognition software in the world, he packed his bags for Bangalore, known as the Silicon Valley of India. India's large pool of highly skilled scientists will earn the country about $100 billion in technology revenue this year.

Yet all of India's science and management talent has been unable to bring its citizens one of the basic comforts of modern life: a steady supply of running water. Fewer than half of Indian households have tap water in their homes. Almost all who do have it only get service for a few hours a day. Tens of millions don't have any source of clean drinking water at all.

The Daily Hunt for Water

No major city in India offers water 24 hours a day to all its customers. Those who can afford them buy pumps and storage tanks to capture as much water as possible while it's flowing. Those who can't store enough to meet their needs rely on tanker trucks to deliver water to their neighborhoods. To get the trucks to come, though, isn't easy. City dwellers may have to call and plead with water authorities over and over, or even bribe the drivers.

Once people know a tanker is on the way, someone must leave school or work to meet it. Because of the importance parents place on boys' education, that someone



The Cyber Gateway building in the "Cyberabad" area of Hyderabad, India, is dedicated to the burgeoning Internet technology software industry in the country. Many hope that revenues from the industry will help solve the country's water problems.

is often a preteen girl. Armed with paint cans and cooking pots, neighborhood residents each toss a hose—not always a clean one—into the tanker. Kids ride home on wobbly bicycles laden with 50- to 100-pound water containers, or walk with cans balanced on their heads. If they slip and spill a little, the family might not have water for tooth brushing that week.

In most rural villages, there are no pipes or tanker trucks. Girls might walk a couple of miles to a neighboring village's well, hoist heavy water buckets from 20 feet below ground level, and then carry full containers back home. Even two trips a day are often not enough to meet a family's daily water needs.

Finding *safe* water is even harder. Rivers are blackened by untreated sewage and fertilizers and manure that run off from farms. Ever since clothing factories in the city of Tirupur began dumping brightly dyed wastewater into the local reservoir, crops won't grow on the area's farms, and clothes washed in the reservoir come out with holes in them. The World Health Organization estimates that over 700,000 Indians a year die because of poor water and sanitation.

Water Slipping Away

India's problem isn't so much a matter of water shortage, as water mismanagement. You might think that water only flows for a few hours a week because cities don't have enough. Yet studies show that people actually use more water when they're frantically trying to get all they can before it shuts off rather than when it's available all the time.

India can't deliver water 24/7 because its pipes just aren't sturdy enough. They're often laced with tiny cracks, and if they were forced to hold water pressure all day every day, water would pour from those growing leaks. As it is, the pipes in some major cities may be losing as much as half of the water that runs through them.

Replacing those leaky pipes would save money and water in the long run, but it would require a lot of money right now, and water authorities don't have it. Because the government charges very little for water, and because many pipes have no meter to measure water use, money from

Women in Mumbai, India, stand in line with vessels to collect their daily ration of water.

water bills doesn't come close to covering the system's current costs, let alone allow for major improvements.

More than anywhere else, India's water is lost on its farms. In the 1960s, a drought drastically reduced the country's grain production. Determined to prevent mass starvation, the government began offering free electricity to farmers. Farmers used electrical equipment to dig many wells and pump up groundwater—the number of wells rose from 800,000 in 1975 to 22 million in 2000. The farmers' hard work held back the famine.

Their success came at an alarming cost. Satellite analysis shows that India is losing an amount of groundwater every year equal to almost half of Lake Erie. Wells will continue to dry up until people begin using groundwater more slowly than rainfall can replace it. Tragically, studies suggest that over half of all the water used in India each year goes to *unnecessary* irrigation. Because using electricity to pump water costs so little, farmers have little reason to avoid wasting it.

A Growing Danger

Finding a better way to manage India's water is becoming especially urgent for two reasons. First, the water supply must serve more and more people. Fifty years ago, India's population was under 500 million, but by 2040, the number will have passed 1.5 billion, making India the most populous nation in the world.

WATER REPORT CARD

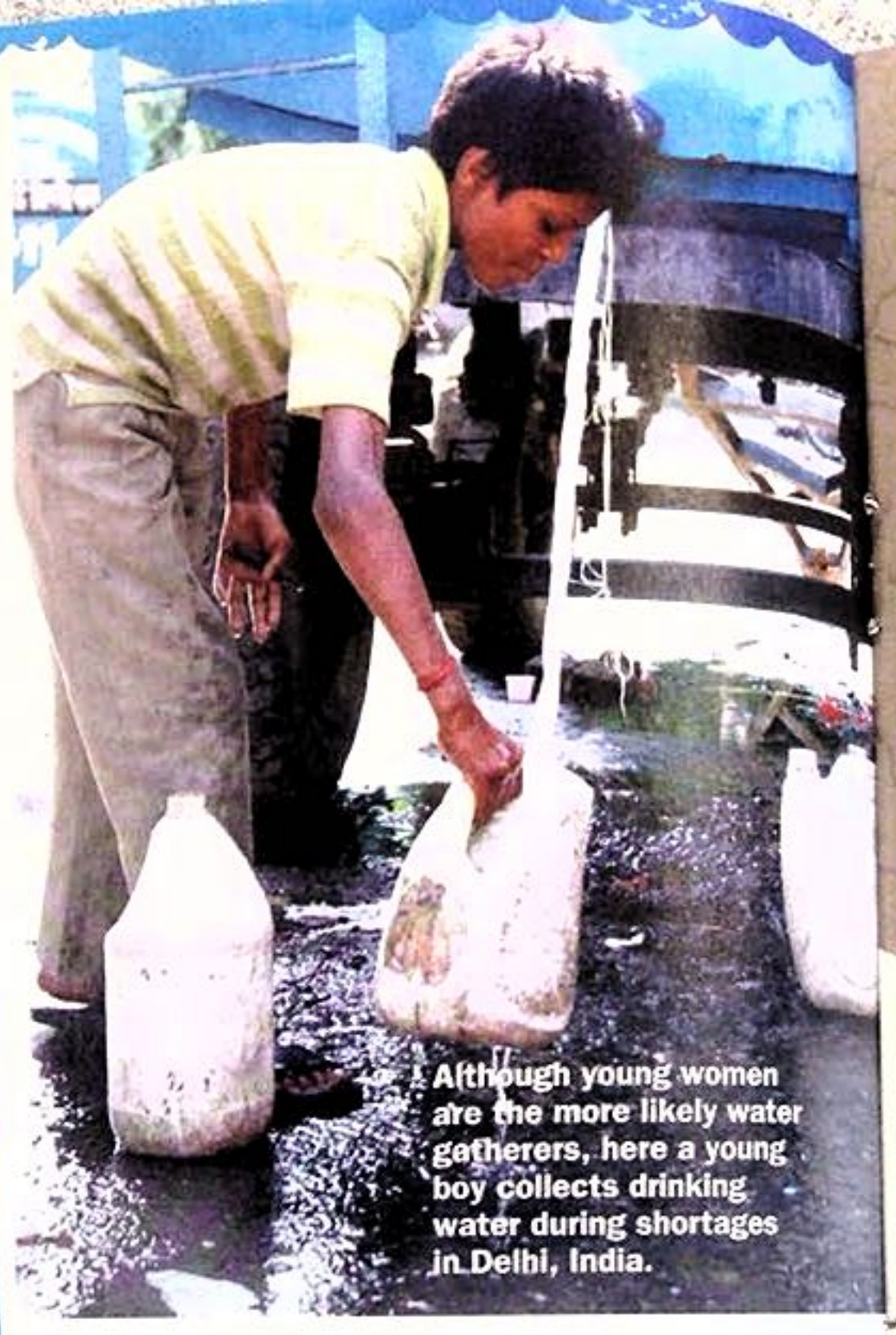
According to the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) 2012 report, some progress has been made in improving access to clean water and adequate sanitation around the world. The report estimates that 63 percent of the world's population now has access to improved sanitation and 89 percent of the global population now uses improved drinking water sources. The tight world economy and rapidly changing financial, political, and physical environment have made governments and donors more unpredictable when it comes to providing resources for water access. According to GLAAS, even if progress continues at the same rate, in 2015, 605 million people would remain without access to an improved drinking water source, and 2.4 billion people would be without access to improved sanitation facilities. Without proper sanitation and water supplies, billions will remain at risk of conditions such as ***diarrhea.*** In 2011, diarrhea killed 2 million people and caused 4 billion episodes of illness.

DIARRHEA — Excessive evacuation of watery feces

People around the world will need to keep using various technologies for improving water and sanitation facilities. Many of these technologies are very simple, such as rainwater harvesting systems or deep borehole wells, and don't require elaborate machinery or professionals to implement. (It is important to note that "improved" water can still sicken people.) Simple technologies using local materials have the greatest chance of success, both in operating and maintaining these systems.

You too can play a part in the global water crisis solution. The easiest thing to do is to save water at home and anywhere else where you spend time. Urge others to do the same. Spread the word about water conservation and the world's water crisis. You can even speak out to elected officials when it comes to water issues. Remember, the water crisis isn't just about other countries now. It's a problem that will increasingly affect the United States as well. It's a problem that we will all need to work on together.

—*Marcia Amidon Lusted*



Although young women are the more likely water gatherers, here a young boy collects drinking water during shortages in Delhi, India.

Second, India, like the rest of the world, is experiencing climate change. Rising temperatures mean that water will evaporate more quickly from rivers, reservoirs, and soil, explains Veena Srinivasan, a senior research affiliate at the Pacific Institute's International Communities and Water Initiative. The mountain glaciers that feed India's major rivers are rapidly melting away.

Climate change is also likely to make the weather more unpredictable, bringing "too much rain in some years and too little in others," says Srinivasan. Indians have long counted on the rainy summer monsoon season to help renew the water supply, but they may soon need to manage that supply through years of flooding followed by years of drought.

Strategies for Change

Experts have many good ideas for making the water supply safe and accessible. First, if *people pay for the water they use*, they

Climate Change and the U.S. Water Crisis

GLOBAL WARMING IS IMPACTING THE WORLD WATER CRISIS, AND NOT JUST IN COUNTRIES LIKE INDIA.

"One of the most troubling impacts of unchecked global warming involves the U.S. water supply," says Dr. Peter H. Gleick, President of the Pacific Institute in California. "Global warming will change when and where we get snow and rain. If our snow pack melts too quickly or if water that falls as snow turns to rain, we'll see more flooding in the winter and less water during the summer when we need it most." In fact, in 2012 the United States saw one of the worst droughts in its history, which affected 80 percent of its farms. That drought is expected to impact food prices through 2013.

Climate change can't be turned around quickly, but something can be done to address the growing water crises around the globe. "We must look at ways to increase our efficiency of use, instead of just building more dams and reservoirs," says Gleick. "Improving the efficiency of our water systems, taking real steps to tackle global warming, and opening the policy debate over water to new voices can help turn the tide."

—Marcia Amidon Lusted

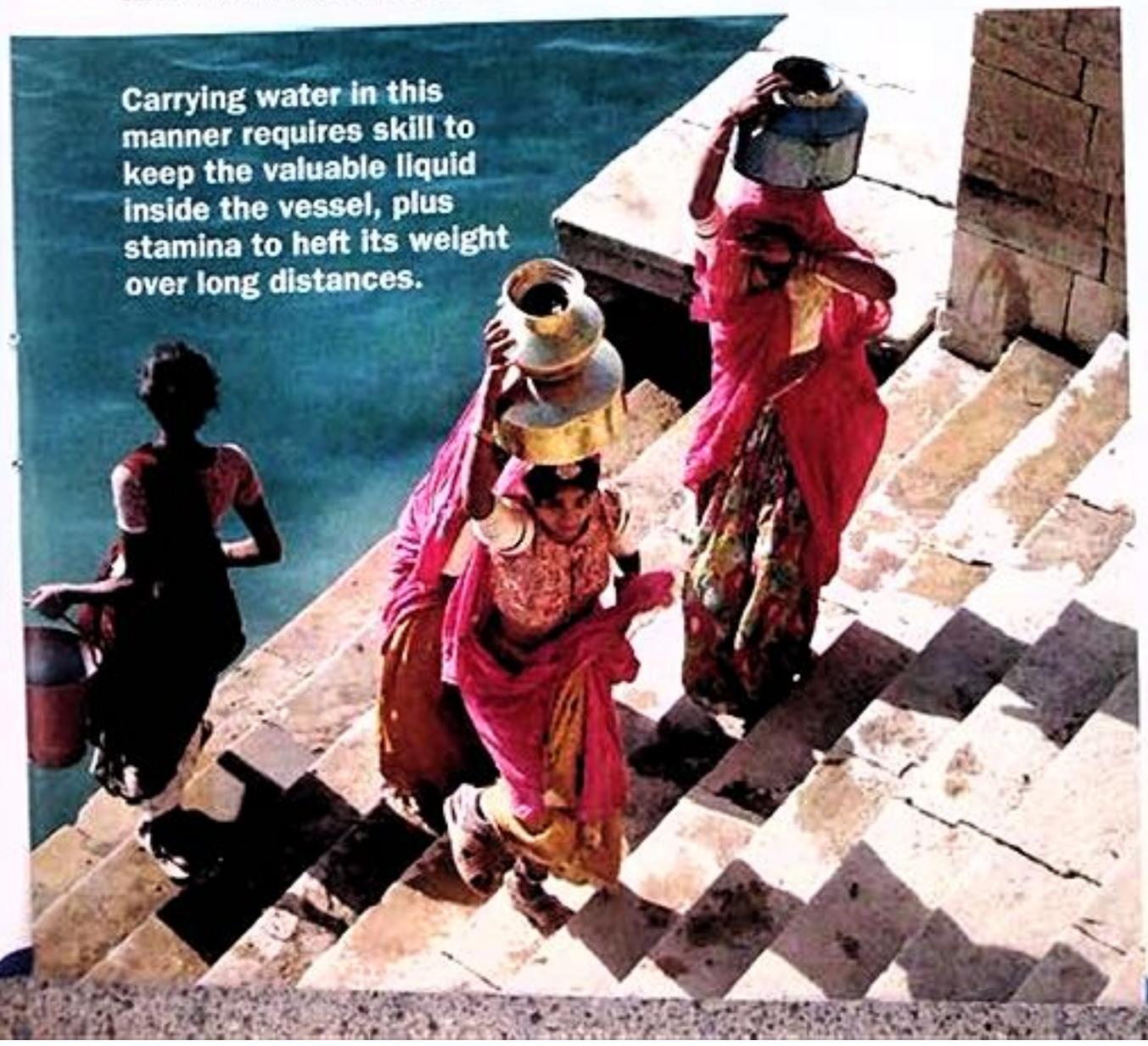
will make wiser choices, and water authorities might have enough money to maintain the pipes. Srinivasan argues that rates should be raised, and more of the water used in wealthy homes should be measured by meters. Rajendra K. Pachauri, director of New Delhi's The Energy and Resources Institute, has called for the government to begin charging farmers more for electricity.

Second, experts want to *educate people* on how to protect the water supply. Srinivasan favors programs to teach them how to use less water at home. Sanmugam Prathapar of Delhi's International Water Institute wants more families to learn how to boil and filter water to make it safe to drink. Farmers can be taught irrigation methods that use less water, and encouraged to plant grains like sorghum and millet that don't require a lot of water.

Third, *water storage* must improve. Srinivasan says that India should expand reservoirs so it can capture heavy rainfalls, perhaps holding the excess water underground, to be used during the droughts that may now come.

Fourth, *polluters must act more responsibly.* Leading conservationist Rajendra Singh has urged that factories be required to treat wastewater so that it's clean before they release it into the water supply. He also believes they should face tougher penalties when they do pollute. Recently a court shut down over 700 polluting clothing factories in Tirupur.

Unfortunately, the shortage of clean water is just one crisis facing India, a nation where hundreds of millions of people can't read or write, and one third have no electricity. Many in India are hoping that the fast-growing technology industry will bring in enough money so that people won't have to choose which problem to solve.



Carrying water in this manner requires skill to keep the valuable liquid inside the vessel, plus stamina to heft its weight over long distances.