

WATERWORLD

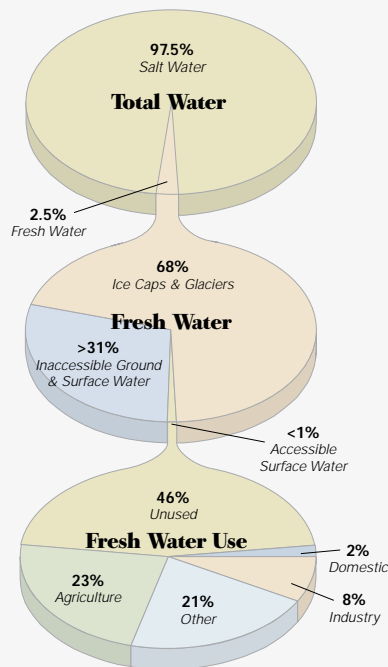
The global scarcity of water is overblown. The real problem is sanitation

Earth is awash with 35 million cubic kilometers of fresh water. That's about 1.5 billion gallons for every person alive today. The current *effective* supply, however, is only a small fraction of that gargantuan figure. As the pie graphs at the lower left show, 68 percent of the earth's fresh water is locked up in ice caps and glaciers, and more than 31 percent is buried deep underground. Less than one percent of all fresh water on earth is easily accessible runoff—though even that tiny sliver represents about 524,151 gallons annually for each one of us.

The world's water, however abundant, is, of course, unevenly distributed. The amount of water per capita (usually described and compared using the metric system) ranges from a high of more than 10 million cubic meters per year, in Greenland, to a low of ten cubic meters, in Kuwait. As the map indicates, forty-three countries currently fall below the internationally recog-

THE EARTH'S WATER

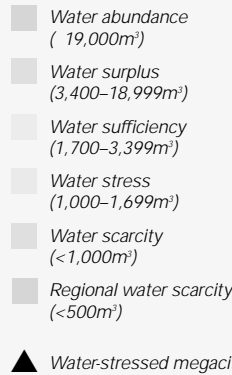
Where it is and where it goes



DECLINING U.S. WATER USE

The United States is the third largest consumer of water in the world; only India and China consume more. In the twentieth century the amount of water used here rose steadily and rapidly until about 1980, when it reached 430 billion gallons (1,900 gallons per person) a day. By 1995, despite continued economic and population growth, overall water use in the United States had declined by about 10 percent, per capita use by more than 20 percent. The drop was mostly due to increased efficiency.

YEARLY WATER SUPPLY PER CAPITA



nized benchmark of “water sufficiency”: 1,700 cubic meters per person per year. Twenty-nine of those countries experience “water scarcity,” meaning a supply of less than 1,000 cubic meters per person. Many countries in North Africa and the Middle East simply do not have enough water for their citizens. Even some countries with a sufficient total water supply have pockets of regional stress, including areas with large and growing populations, like northern China.

Although the 6.3 billion people on earth today use only about 54 percent of the runoff that becomes readily available each year, those figures are expected to rise to 7.8 billion and 70 percent by 2025. This has prompted dire warnings from scientists and policymakers about an impending water shortage. But constructive steps are being taken to temper demand and expand supply—and there is room to do both. For instance, irrigation, which accounts for nearly half of all water used each year, is notoriously inefficient; in some developing coun-

tries only 38 percent of the water put to agricultural use actually helps crops grow. Even a proven but not widespread improvement such as drip irrigation could drastically increase efficiency, thereby lowering demand. On the supply side, building more dams and reservoirs could expand the percentage of runoff that is “caught” for human use; current systems catch only 12,500 of the 40,000 cubic kilometers of runoff available each year. And we haven't really begun to tap the enormous supply of harder-to-reach deep groundwater. Today we use only

THE TROUBLED NILE

Many rivers in the world are being depleted and fouled by overuse, particularly for irrigation. The Nile is a prime example. More than 90 percent of its natural flow is drawn off by farmers or industry, or evaporates from the surface of reservoirs. Only a small portion of the river ends up flowing into the Mediterranean—and the portion that does is heavily polluted by fertilizers and industrial waste. (The same is true of the Colorado River, in the United States: irrigation, canals, and evaporation draw off so much of the Colorado that only a small and polluted amount, if any, reaches the Gulf of California.)

MOVING "RIVERS" IN CHINA

In an effort to bring water to drought-prone northern China, the Chinese government is digging three giant canals to carry water from the Yangtze—the world's third largest river. The canals will each stretch more than 700 miles and will eventually carry 12.7 trillion gallons of water—enough to supply New York City with water for more than a quarter century—each year.

WATER PROBLEMS

- Insufficient drinking water (>50% of population without safe drinking water)
- Insufficient sanitation (>50% of population without modern sanitation)

THE DESALINATION OPTION

Taking the salt out of salt water is expensive. Desalinated sea water costs \$2.50 to \$16 per 1,000 gallons (versus \$.50 to \$2.00 for the same amount of conventionally treated water in the United States). Only the oil-rich countries of the arid Middle East rely on desalination for a substantial portion of the water they consume. Kuwait (which gets 51 percent of its water through desalination), the United Arab Emirates (16 percent), and Saudi Arabia (four percent) lead the list. The United States desalinates about 332 million cubic meters annually—less than one percent of the water it uses.

SOURCES: WATER FOR PEOPLE, WATER FOR LIFE (UNESCO, 2003); THE WORLD'S WATER, 2002-2003 BY PETER GLEICK (ISLAND PRESS, 2003); WORLD RESOURCES INSTITUTE

600–700 cubic kilometers of easily accessible groundwater annually, whereas estimates put the amount of total groundwater in the earth at something on the order of 10 million cubic kilometers.

The fact is, dirty water presents a much greater and more intractable problem than water scarcity. About two fifths of the world's population lacks access to modern sanitation. Unsurprisingly, sanitation problems display a distinct geography: rural people suffer more than urban (approximately 80 percent of those who lack access to sanitation live in rural areas), and poor countries suffer more than wealthy ones. In India and China

together more than 1.5 billion people live in areas without sanitation facilities.

One of the world's leading pollutants is human and animal excrement. Many countries dump raw sewage into their water supplies; poor, predominantly rural nations are often unable to clean this fouled water before people use it for bathing, cooking, or drinking. Afghanistan is worst off: 87 percent of its population lacks access to clean water. A number of African countries—including Ethiopia (76 percent), Chad (73 percent), and Sierra Leone (72 percent)—are not far behind.

Dirty drinking water causes widespread illness. More than two million

people die each year from waterborne diseases, which are almost entirely preventable. The great majority of these deaths come in developing nations, among children under the age of five.

Cleaning dirty water and preventing its myriad consequences is not easy. Sewers to remove fouled water, treatment plants to clean it, and hospitals to treat those sickened by waterborne illness are expensive. And African and South Asian countries, which suffer the most from dirty water, are generally the least able to build a clean-water infrastructure. These nations don't have a shortage of water; they have a shortage of money. —JEN JOYNT AND MARSHALL POE