World's Water Resources Face Mounting [PRESSURE]

By **Elizabeth Mygatt**
Staff Researcher, Earth Policy Institute

Global freshwater use tripled during the second half of the 20th century as population more than doubled and as technological advances let farmers and other water users pump groundwater from greater depths and harness river water with more and larger dams. As global demand soars, pressures on the world's water resources are straining aquatic systems worldwide. Rivers are running dry, lakes are disappearing, and water tables are dropping.

Much of the growth in water use over the past half-century is from a vast increase in irrigation, which is used to produce 60 percent of the world's grain. Globally, irrigated area nearly tripled between 1950 and 2003, growing from 94 million to 277 million hectares. This growth, however, is tapering off as the water needed to expand irrigation becomes increasingly scarce. Forty years ago, irrigated area was expanding at an annual rate of 2.1 percent, but the last five years of data reflect slower growth of only 0.4 percent.

Meanwhile, the extent of irrigated area per person reached a high of 47 hectares per thousand people in 1978 and has been shrinking steadily since 1992. In 2003, per capita irrigated area dropped below 44 hectares per thousand people, the lowest level of the past four decades. With population growth outpacing growth in irrigated area, this figure is unlikely to rebound substantially.

As demand for water continues to grow to satisfy rising agricultural, industrial, and residential needs, aquatic ecosystems struggle to respond. Countless communities depend heavily on rivers, both for direct water use and as a source of energy. But as upstream populations increase their demands, downstream communities have less water available to them. In some cases, rivers become so overexploited that they cease to exist altogether.

The Colorado River in the southwestern U.S. is among the world's rivers that run dry for at least part of the year, depleted by southwestern farmers and thirsty cities alike, with more than one-fourth of these withdrawals—3.8 trillion liters—going to California alone. Other rivers, including the Ganges, the Indus, and the Nile, are sometimes little more than a trickle by the time they reach the sea.

As rivers run dry, the lakes that rely on them suffer as well. Lake shorelines are receding and water levels are dropping due to dramatic reductions in inflow from rivers and streams, declining recharge from overstressed aquifers, and increasing water withdrawals from lakes. For example, Mono Lake in California has fallen by 11 meters since 1941, the year Los Angeles first began to draw water from its tributaries.

Falling water tables are less obvious indicators of global water shortages than disappearing lakes and dry riverbeds. Yet groundwater reserves are becoming increasingly depleted, due in large part to the rise in irrigated area and the growing use of water for industrial purposes. Aquifers that supply irrigation water to some of the world's major grain producers are of particular concern because they cannot be replenished.

While groundwater is integral to today's agriculture, it is also a valuable resource in urban environments. Some of the world's largest cities, including Mexico City, Calcutta, and Shanghai, rely heavily on local groundwater. Worldwide, it is esti-

mated that roughly two billion people—in both rural and urban environments—rely on groundwater for daily water consumption.

With the projected addition of 2.6 billion people to the global population by 2050, most of them in countries where water tables are already falling and wells are going dry, water shortages will likely become more commonplace and more severe. Absent a global effort to quickly slow population growth and to use water more efficiently, water shortages may translate into food shortages in more and more countries.

Water resources are one of 12 indicators that the Earth Policy Institute monitors in the development of what they call an eco-economy. Learn more about EPI's work by visiting their Web site at www.earth-policy.org.

A graduate of Williams College, **Elizabeth Mygatt** is the staff researcher at the Earth Policy Institute. In this position, she conducts research and writes and edits *EPI's Eco-Economy Indicators* and *Eco-Economy Updates*.

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