

By Dan Deely and Meg Falter

Droughts? Floods? Famines? Water is the key

U.N. figures show that as many as 450 million people may be living under conditions of severe water scarcity and water stress (where the environment's capacity to produce sufficient water for the population is challenged).

The United Nations also projects that more than 2 billion people will be living under water-scarce and water-stressed conditions by the year 2025. Many experts consider both of these standard estimates much lower than the actual numbers.

For example, a recent study by the University of New Hampshire estimates that 1.75 billion people may already be living under a high degree of water stress.

Either way, a water crisis long feared by experts is becoming increasingly evident to others.

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where water was once considered to be plentiful.

"VISION for a Water Secure World," which was released at the World Water Forum in the Hague in March, states that if current trends continue, there simply will not be enough accessible fresh water to meet the needs of growing populations, industry and agriculture.

In an Earth Day statement this April, Secretary of State Madeleine Albright called for a global alliance for water security in the 21st century.

Several interrelated factors are at play in the swirl of relationships among water, food, agriculture, weather variability and extremes like droughts, floods and famine. Both droughts and floods can cause damage to crops. While famine and nutritional deficits may result from conflict, government inaction, persistent poverty and other social and economic factors, most famines are also linked to water.

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Irrigation

Irrigated agriculture uses more than 70 percent of the world's total water supply — and up to 90 percent in some developing countries. Much of the increase in food production over the past 50 years has required greater use of irrigation. The long upward trend in irrigation has already been reversed in many of the drier areas of the world, including the American West, as over-pumping of groundwater and excessive withdrawals from river watersheds has lowered water tables and river flow.

China is currently the world's largest producer of grain, but more

than half its cropland is irrigated. Its largest river, the Yellow River, failed to reach the sea for the first time five years ago. It has since run dry before reaching the sea on as many as 220 days in a single year.

The International Water Management Institute (IWMI) has estimated that even if water is used more efficiently, allocations to irrigation would need to be increased by at least 17 percent worldwide by 2025.

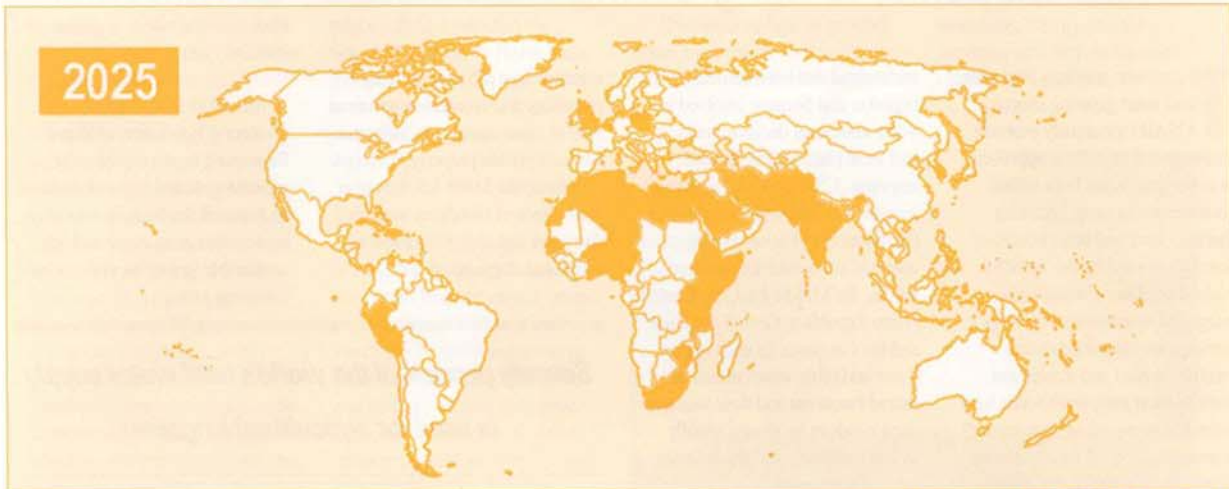
If the additional water needed for irrigated agriculture is not available, pressures to further expand rain-fed agriculture to meet the deficit could have serious environ-

Water scarcity in 2000 affects 450 million people in 31 countries



Source: Population Action International

Water scarcity in 2025 will affect 2.8 billion people in 48 countries



Source: Population Action International

mental consequences. More forest and marginal lands would have to be cleared for crop production.

The gravity of the situation is made worse by a projected 20 percent increase in demand for water by industry, and by a projected 70 percent increase in demand for water by municipalities for domestic uses.

Aquifer depletion

Problems relating to surface freshwater may be eclipsed by the serious and worsening groundwater situation. In what amounts to “mining” the aquifers, water is taken from underground supplies much faster than it can be replenished in many places, which causes wells to go dry or the water to become unusable as groundwater levels drop.

Water and energy subsidies in many developing countries encourage the rapid spread of small pump irrigation, which contributes to groundwater depletion. Worldwatch Institute warns that water shortages may lead to famine unless governments in

water-short countries act quickly to stabilize population and to raise water productivity.

Rising needs for importing grain in water-scarce China and India could make food less affordable in other low-income countries with water deficits. This could make the goal of reducing chronic

malnutrition unachievable.

More severe and variable weather

Global warming may be a factor in some observed patterns of increasing weather variability and extremes, with more frequent

weather extremes with severe El Niño/La Niña cycles and associated droughts and floods in Africa, Asia and South and Central America, and more people are in harm’s way each year should natural disaster strike. People living in squatter settlements around the margins of urban centers are especially vulnerable.

The Horn of Africa has experienced particularly marked cycles of above-normal and below-normal rainfall. An extended drought put 20.7 million people in seven countries in the region at risk of starvation, but widespread famine was averted in the Horn. Drought in Kenya still threatens 3 million people. In the same sub-region only two years ago, both Kenya and Tanzania declared flood disasters. ■

—Deely and Fator are members of USAID’s Water Team.

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Most of the expected world population growth will take place in the burgeoning urban areas and megacities of developing countries, where large segments of the popu-

lations already lack basic sanitation and clean water.

crises caused by severe floods and extended droughts. The theory is that if global warming accelerates the “water cycle”—the process through which water vapor, mainly from the oceans, rises into the atmosphere before condensing out as precipitation—weather could become more extreme and variable.

Recent years have dramatically demonstrated the impacts of