Deserts Advancing, Civilization Retreating

by Janet Larsen

The coalition forces which advanced northward from Kuwait to Baghdad traversed the site of the world's first civilization—ancient Sumer. More than five thousand years ago, the Sumerians inhabited the rich land between the Tigris and Euphrates Rivers—part of the legendary Fertile Crescent. There they developed a sophisticated irrigation system, built the first cities, devised a written language, and invented the wheel.

Yet the Fertile Crescent as now seen in press coverage of the war in Iraq appears to be anything but fertile. Strong winds ripping across the dusty floodplains of the Tigris and Euphrates and the surrounding area catch fine dust and sand, creating choking storms that impede movement, impair visibility, and threaten human health. Once-fertile land is now desert.

Unfortunately, this situation isn't unique. The pressure of the world's 6.2 billion people is slowly turning productive land into desert on every continent. Cultivation of marginal land has eroded soils, while some three billion cattle, sheep, and goats have pushed pastures beyond their sustainable limits. All told, desertification plagues up to one-third of the Earth's land area, affecting more than one billion people in 110 countries.

Although deserts regularly expand and contract, the acceleration of human-induced desertification is fast undermining rural economies. Each year, deserts claim millions of hectares of cropland and rangeland. Africa—with almost half its land area at risk—is most vulnerable, but satellite images and on-the-ground reports confirm that desertification is widespread throughout the world's drylands.

In the Sistan basin shared by Afghanistan and Iran, windblown dust and sand have buried more than one hundred villages. A former oasis that only five years ago supported at least one million cattle, sheep, and goats is now nearly barren. As overgrazed pastures turn to sand, hundreds of thousands of livestock have perished, and villagers have abandoned the area.

To the north, along Afghanistan's Amu Darya River, destruction of protective vegetation has exacerbated the effects of drought and allowed the formation of a sand dune belt that is some 300 kilometers long and 30 kilometers wide. These dunes, moving up to one meter per day, are blocking roads and swallowing villages no longer shielded by local forests.

In Kazakhstan, overtaxed farmland is being abandoned as productivity falls. Overplowing of marginal land during a Soviet attempt to boost grain harvests in the 1950s led to widespread wind erosion of soil. Since 1985, Kazakhstan has abandoned half of its twenty-five million hectares of grain land.

In China, desertification threatens the livelihoods of millions and racks up direct annual economic losses of roughly $6.5 billion, including the cost of reduced farm productivity. A report from the U.S. Embassy in Beijing, China, entitled *Desert Mergers and Acquisitions* reveals that in northwest China, prolonged dry weather, overgrazing of pastures, and rampant harvesting of wild plants have loosened sand on the edges of the country's third- and fourth-largest deserts. Strong winds are pushing destabilized dunes southward from the five-million-hectare Bardanjilin Desert toward the three-million-hectare Tengry Desert, literally laying ground for a merger.

A similar situation exists in China's Xinjiang Autonomous Region. Excessive upstream dam building and water withdrawals for agriculture have dried up the Tarim River. As a result, large poplar groves and other vegetation that once served as a barrier between the Taklamakan and Kumtag Deserts have died off. Now the two deserts are moving steadily toward each other, and they too may merge.

These problems aren't isolated, nor are they purely local in scope. Massive dust storms originating in China and Mongolia have traveled as far east as the continental United States. Two countries directly in the path of the suffocating dust—Japan and South Korea—have teamed up with China to promote rehabilitation of the degraded lands that feed these ocean-traversing storms.

The secretariat of the United Nations Convention to Combat Desertification has projected that, without concerted efforts to arrest and reverse desertification, Asia could lose one-third of its arable land. In South America, arable land area could shrink by one-fifth. In Africa, two-thirds of the arable land could be lost, reinforcing poverty and food insecurity and quickly adding to the ranks of environmental refugees.

Nigeria, Africa's most populous country, loses

some 350,000 hectares of land—about half the size of the U.S. state of Delaware—to the encroaching Sahara Desert each year. Desertification from a combination of excessive population pressure, poor land management, overgrazing, and drought affects over half the land in ten of Nigeria's northern states, which have a combined population of twenty-nine million. As deserts expand, the competition between farmers and pastoralists for the remaining productive land intensifies.

In Kenya, over 80 percent of the land is vulnerable to desertification—land that supports nearly one-third of the country's thirty-two million people and half of its twenty-eight million cattle, sheep, and goats. Unprecedented population growth has led to inappropriate land use and accelerated deforestation. People and their livestock have been forced onto marginal lands, and farmers have reduced fallow periods, furthering soil degradation.

The means of combating desertification varies among countries, depending on local climatic and social conditions. Efforts to turn back the deserts and break the cycle of poor land management and poverty hinge on raising the incomes of the one billion people worldwide who live on less than one dollar per day. Reduced family size and education also play key roles in lowering pressure on the land and fostering stewardship.

Though desert margins are particularly at risk, any land that is completely cleared of vegetation is vulnerable to desertification. Restoring vegetation in vulnerable areas can stabilize soils so that they don't blow away. Realizing this, the Chinese government has launched the world's largest tree planting project in an attempt to stop the encroaching desert.

To prevent wind and water erosion, farmers can practice conservation agriculture. No-till or low-till farming can replace intensive plowing, maintaining soil organic matter and moisture. Conservation agriculture is practiced on some sixty million hectares worldwide, primarily in the United States and South America, but it has great potential to reduce soil erosion and raise crop yields in dry regions in Africa and the Middle East.

Careful management of livestock is necessary to protect the integrity of grasslands. In China, where grasslands are grazed and trampled by 161 million goats, 137 million sheep, and 128 million cattle and buffalo, some local governments have banned goats from feeding on open land. Villagers may receive subsidies to keep their flocks in the farmyard, feeding them with cut forage.

Alternative energy also has a role to play in preventing land degradation. In developing countries, where some two billion people rely on wood and crop residues for cooking, simple devices like solar cookers can relieve pressure on the land. And wind turbines can provide clean energy while serving as windbreaks.

The United Nations Environment Programme conservatively estimates that between 1978 and 1991, some $300 to 600 billion in income was lost worldwide because of the failure to combat desertification. Other analyses have estimated that the benefits from slowing desertification and rehabilitating degraded lands are at least 2.5 times higher than the costs of letting sands take over. A world where productive land area is shrinking while human demands grow isn't a recipe for ecological stability or economic progress.

This article was originally published on the Earth Policy Institute website on March 27, 2003, and can be downloaded from www.earth-policy.org Janet Larsen is a research associate at the Earth Policy Institute where she is an author of several Eco-Economy Updates *on population and natural resource issues and is a coauthor of the* Earth Policy Reader.