

# World's Cropland Losses Portend Food Crisis

Unless we can count on manna from heaven, the world is in for a tough time ahead. The problem: how to feed a growing world population on soils that are declining in productivity and availability. "Cropland is becoming scarce," says Worldwatch Institute President Lester E. Brown, and as such "must be viewed as an irreplaceable resource." Global food shortages and soaring food prices during the 1970s are not an aberration, the agricultural economist warns, but a signal that pressures on croplands are becoming excessive. And they will continue to increase until political leaders, not the marketplace, set land-use priorities, he concludes in a study released last week, "The Worldwide Loss of Croplands."

"Evidence now available raises doubts as to whether it will be possible to get a combination of cropland expansion and yield increases that will satisfy the growth in world food demand projected for the remainder of the century," he says.

One reason is that, since 1971, the rate of growth in world food production has failed to keep pace with population growth. The world population increased 1.5 billion from 1950 to 1975, about 59 percent, while the increase in grain-producing cropland increased from 602 to 731 million hectares, a gain of 21 percent. "This was almost certainly the first generation during which the growth in human numbers so greatly exceeded the growth in cropland," he says.

Meanwhile erosion, desert encroachment, urban sprawl, highway development and years of destructive agricultural practices have removed two hectares from grain production for every one gained.

What's more, the post 1940s trend of increased grain yield per hectare has been arrested, at least temporarily, in China, France and the United States, each the leading cereal producer of its continent. The yield has leveled off in China and certain other agriculturally intensive regions such as Egypt, but it has actually declined in France and the United States. Reasons vary, but the main factor for the U.S. downturn is "undoubtedly the return to production of cropland previously idled under government programs," Brown explains. (When farmers were asked to retire that land, Brown says, they "invariably" chose their poorest, least productive property.)

Soil erosion is perhaps the greatest threat to our planet's food-producing capacity. When it exceeds the natural rate of soil formation, topsoil thins or disappears. Fertilizers can replace lost nutrients but not the valuable structure of topsoil.

U.S. farmers are managing highly erodible soil less well today than they did a generation ago, according to the Agricultural Department's Soil Conservation Serv-

ice. In 1975, an estimated three billion tons — about 22 tons per hectare — of topsoil washed away. And a consortium of Midwest universities, the Council for Agricultural Science and Technology, reported in 1975 that "a third of all U.S. cropland was suffering soil losses too great to be sustained without a gradual but ultimately disastrous decline in productivity."

The problem is global. The U.S. embassy in Jakarta, for example, says that "soil erosion is creating an ecological emergency in Java." The government of Nepal estimates that 240 million cubic meters of soil flows annually down its rivers and into India; it has been called Nepal's "most precious export." And Colombia's estimated loss of 426 million tons each year is particularly grave since its topsoil was thin to start with.

Soil fertility is also waning. "A number of soil surveys and studies indicate that the inherent fertility of as much as one-fifth of the world's cropland is declining," Brown writes. In part it's due to development of prime acreage for nonagricultural uses — housing, expansion of cities and villages, industry. Often the land that replaces it is much less fertile. A newer threat is the developing global trend to shorten or even eliminate the fallow cycles that replenished moisture and nutrients — major fertility factors — to plowed fields. Although this temporarily increases the profit per hectare, in the long run it ruins the soil.

Gullies usually form where subsoils are also erodible. Brown cites Soviet soil scientists who say that as much as 50 percent of their land may gully as efforts to inten-

sify agriculture there proceed.

Brown says there are indications that a steep falloff in the quality of cropland is occurring in several major countries including the United States, Canada, Nigeria, China and Brazil. Since most of the best land is already under the plow, he sees little chance of a more than 10 percent increase in the land devoted to crops by the year 2000.

Don't look for technology to bail us out, Brown says. In the late 1950s there was a wide gap between the average yields of corn in experimental plots at Iowa State University and plots on typical Iowa farms. By the 1970s the gap had "virtually disappeared," Brown says, indicating that "the backlog of technology available to farmers had been largely used up." Other studies support the premise that advanced agricultural societies may have raised yields about as far as they can economically afford to, he adds.

Brown says the ultimate solution probably requires major social changes. Among them: limiting the number of mouths to feed through birth control; instituting land-use planning to protect the best croplands from competing interests (such as industrial developers) in any but the most pressing circumstances; and instituting better soil-protection strategies globally. He cautions that at least the last may reduce food output initially and run counter to the immediate economic interests of farmers and consumers. But he warns that the alternative for a great many countries will be acute land hunger, food shortages, soaring food prices and widespread social unrest. □

*Eroding topsoil reduces quality of croplands. Irrigation erosion on land too steep to irrigate (right). Gullying due to uncontrolled irrigation (below). Rough tillage or crop residues could have protected field from wind erosion (lower right).*



Photos: USDA