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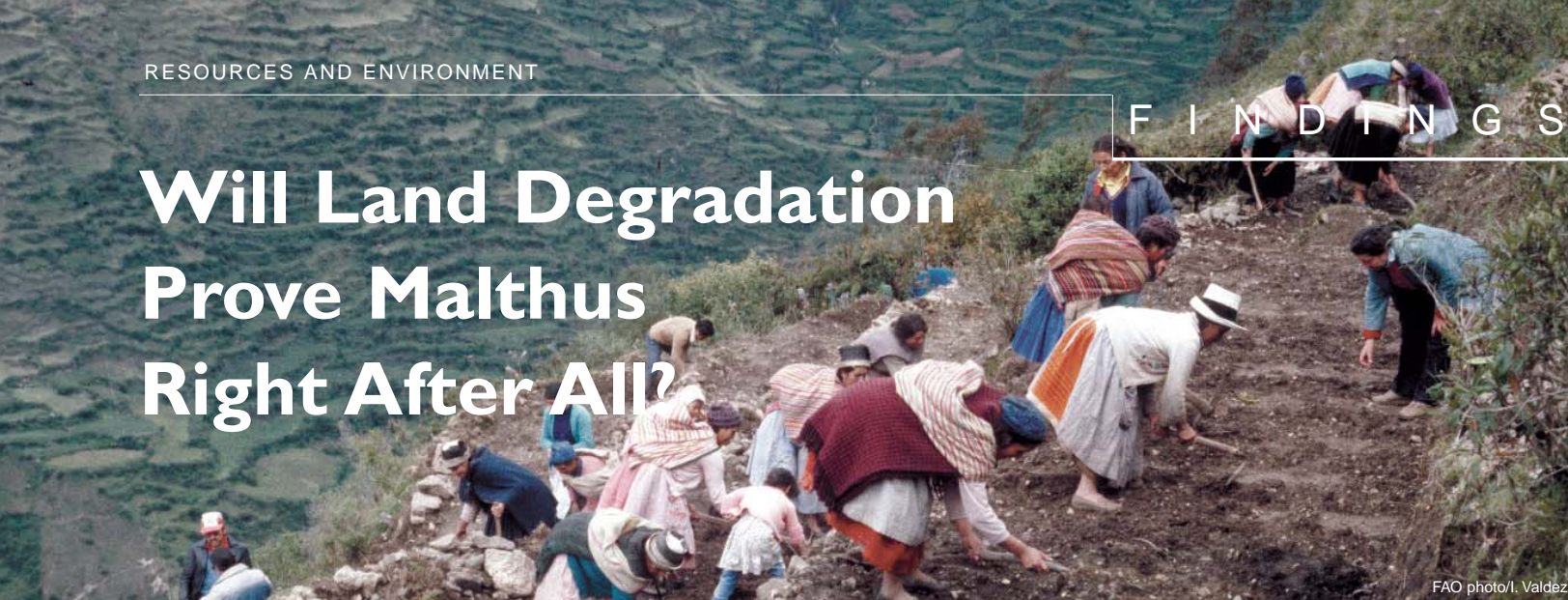
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# Will Land Degradation Prove Malthus Right After All?



FAO photo/I. Valdez

Two hundred years ago, citing concerns dating back to Plato and Aristotle, English clergyman and economist Thomas Malthus argued that population growth would inevitably outpace food production—unless checked by “moral restraint, vice, or misery.” In 1960, his concerns appeared well founded. Growing at an unprecedented rate, the world’s population reached 3 billion, and a third of those were undernourished.

ished. For many of these people, secure and sustainable access to sufficient food for active, healthy lives—food security—depends on income from agriculture, and thus on the productivity of agricultural land and labor.

World-average cereal yields rose by more than 2 percent per year during the 1960s and 1970s, driven by the improved seed varieties and increased input use of the Green Revolution. However, yield growth has slowed since then and the Food and Agriculture Organization (FAO) projects that cereal yield growth will slow to a global average of 0.8 percent per year over the next three decades. Do soil erosion, soil fertility depletion, and other forms of land degradation threaten the productivity gains achieved in the past? Could Malthus be right after all?

Because relevant

data are scarce, the extent to which yields have been reduced by land degradation has been difficult to determine. Recent analysis by ERS economists, in collaboration with soil scientists at USDA’s Natural Resources Conservation Service and Ohio State University, finds that yield losses to soil erosion vary widely by crop and

region, but average 0.3 percent per year worldwide when farmers’ practices are held constant. Given FAO’s projections of slower yield growth, further yield losses of this magnitude could reverse recent reductions in the number of people who are food insecure. However, farmers’ practices do change over time in response to changing conditions, so actual yield losses to land degradation are typically lower. For example, ERS analysis finds that yield losses to soil erosion in the North-Central U.S. are less than 0.1 percent per year when farmers choose management practices that are most profitable over the long term.

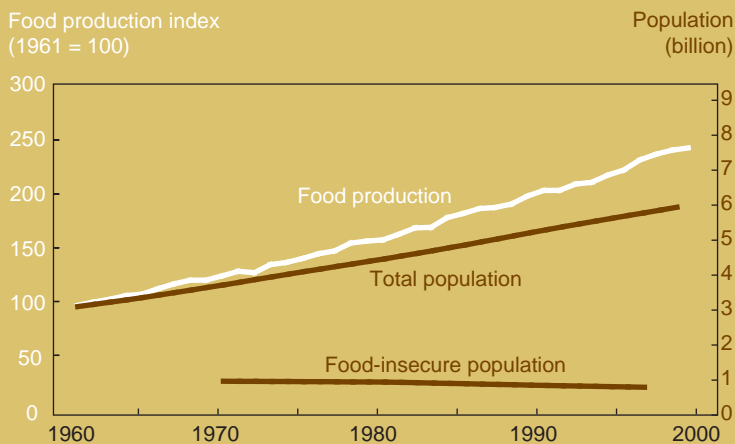
ERS research suggests that land degradation does not threaten food security at a global scale, but impacts vary by location. Yield losses due to land degradation do pose problems in areas where soils are shallow, fields are steeply sloped, property rights are insecure, and farmers have limited access to inputs, information, and markets. Any further slowing of yield growth in the future would increase the importance of measures to address these challenges. **W**

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**This finding is drawn from . . .**

*Linking Land Quality, Agricultural Productivity, and Food Security*, by Keith Wiebe, AER-823, June 2003, available at: [www.ers.usda.gov/publications/aer823](http://www.ers.usda.gov/publications/aer823)

## World food production has increased faster than population, but food insecurity remains a challenge



Source: Based on FAO data.

Forty years later, the world’s population has doubled to 6 billion, but food production has grown even faster, and fewer people are undernourished. Rising food demand led to higher input use and improved technology and efficiency. Even so, more than 800 million people—mostly in Asia and Africa—remain undernour-