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The World Food Problem: Toward Understanding and Ending Undernutrition in the Developing World

FIFTH EDITION

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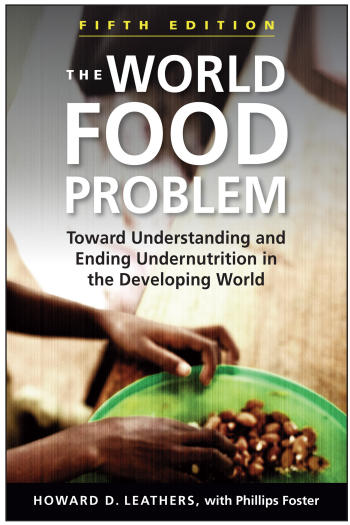

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Introduction

Children dream of changing the world—achieving world peace, ridding the world of disease, ending oppression and injustice. But one of these dreams—eliminating hunger in the world—may just be a dream that comes true in the lifetimes of some readers of this book.

The progress made during the past five decades has been remarkable—about 40 percent of the world's population suffered from undernutrition in the 1960s; today that number is close to 10 percent. And it is not inconceivable that the progress will continue. This achievement has not been the work of a single individual but has come about through the efforts of multitudes—economists, plant scientists, political leaders, farmers, good-hearted people helping their neighbors—to name just a few.

Despite this progress, heart-wrenching problems of undernutrition remain. Images in the media of families migrating in search of food or babies with bloated bellies and bodies too weak to sit up have flooded our consciousness with the horror of hunger. Each decade seems to produce its own horror stories: Famine in North Korea reached such an acute stage in late 1997 that there were reports of people eating grass and tree bark. Southern Africa was the focus of an international effort to avoid widespread death from famine in 2002. In 2015, the tragedy of refugees from Syria and the Sudan leapt into newspaper headlines and political debates. One estimate puts worldwide deaths from starvation during the 1990s at 100,000 to 200,000 per year (Kates 1996).

When a person dies of hunger, what happens? Describing famine-related death, an anonymous author writing for *Time* magazine put it eloquently and succinctly:

> The victim of starvation burns up his own body fats, muscles, and tissues for fuel. His body quite literally consumes itself and deteriorates rapidly. The

> kidneys, liver, and endocrine system often cease to function properly. A shortage of carbohydrates, which play a vital role in brain chemistry, affects the mind. Lassitude and confusion set in, so that starvation victims often seem unaware of their plight. The body's defenses drop; disease kills most famine victims before they have time to starve to death. An individual begins to starve when he has lost about a third of his normal body weight. Once this loss exceeds 40 percent, death is almost inevitable. (Anonymous 1974:68)

Although the drama of famine tends to capture our attention, most hunger-related deaths do not occur in famines. They happen daily—quietly and largely unchronicled—all around the world. Figures vary, but one estimate (Katona and Katona-Apte 2008), using data provided by the World Health Organization (WHO) of the United Nations, says that some 3 million children die annually from hunger. This amounts to one death every ten seconds.

In previous editions of this book, we asked readers to imagine the media coverage that would ensue if a 747 jet crashed, killing all 220 children on board. The deaths attributable to hunger are equivalent to 37 of these jet crashes every day. After the terrorist attacks of September 11, 2001, in New York City and Washington, DC, we no longer have to imagine the media coverage, or the grief, or the universal resolve to never let it happen again. The tragedy of undernutrition fails to stir such outrage or determination. The world hunger problem is too pervasive, too commonplace, too remote.

Of course, as these numbers make clear, not all hunger is fatal. Consider this common scenario, played out again and again in developing countries: Picture a loving but poorly educated, poverty-stricken mother with several children. Food is scarce. Her youngest child has not grown for months because of undernourishment, and the baby's resistance to disease has fallen to a very low level. The family's supply of water is unsanitary. The older members of the family can handle the microorganisms in the water, but the baby develops diarrhea. He loses interest in eating. He seems more willing to take liquids, so the mother removes solids from his diet. Because liquids cannot provide enough nourishment to conquer his illness, the diarrhea continues. Finally, in a desperate but seemingly logical attempt to stop the diarrhea, his mother removes liquids from his diet as well. By now, the boy is feverish, and limiting liquids accelerates the baby's loss of fluids. Severe dehydration follows, with death not far behind.

While adult males do die of hunger during times of famine, most hunger-related deaths, whether from famine or from chronic undernutrition, occur among preschoolers. Pregnant and lactating women are also at substantial risk, although less so than children. Malnutrition in children takes many forms. Undernourished children may be crippled by vitamin D deficiency, blinded by vitamin A deficiency, or stunted by protein deficiency. But the most common form of child undernutrition results simply from a lack of sufficient calories, with disease and death too often the result.

The purpose of this book is to provide a general introduction to the world food problem, its causes, and possible ways of addressing it. Our intention is to encourage the reader to be objective and analytical. We try to avoid advocating any particular point of view while also avoiding turning a blind eye to inconvenient facts. As the past few paragraphs suggest, the pages that follow are replete with statistics and with inferences drawn from those statistics. We invite the skeptical reader to contend with us, to point out other inferences that can be drawn or other factual information that leads in a different direction.

Part 1 of this book presents some factual background. What is undernutrition? How does being undernourished affect a person? How can we determine whether a person is malnourished? What do we know about the extent of undernutrition in different periods of time and in different geographical areas?

Factors Influencing Food Supply and Demand in the Future

Part 2 deals with factors that influence the extent of undernutrition. The framework we use to outline these factors is the framework of economics: supply and demand. As we look to the future, global quality of life will hinge on whether world food supply grows faster or slower than world food demand. If supply grows more rapidly than demand, average quality of life in the world will almost certainly improve—food prices will fall, making it easier for poor people to afford an adequate diet and freeing up income for the rich to spend on other goods and amenities. By the same token, if demand outpaces supply, quality of life is likely to deteriorate.

In analyzing future prospects for food supply and demand, there are four particularly critical factors, which we refer to as the four Ps:

- Population
- Prosperity
- Pollution (or environmental resource quality)
- Productivity in agriculture

The impact of population growth on food demand is obvious. More mouths to feed means more demand for food.

Widespread economic prosperity means that more people can afford adequate diets and that people are more likely to have access to healthcare, a sanitary water supply, and education. Income levels also affect food demand—as people attain higher income levels, they tend to buy more food and a wider variety of it, including meat and animal products. So 7 billion relatively affluent people require significantly more agricultural production than do 7 billion relatively poor people.

Pollution, environmental quality, and the availability of land and water resources needed for agricultural production are critical factors in analyzing the future of agricultural production. To what extent can a population expand the

area it devotes to agricultural production? Will soil erosion or water pollution result in land that is less arable or less irrigable? How will global climate change affect agricultural production?

Agricultural productivity refers to the amount of food produced on a given area of agricultural land. Regardless of environmental quality and land and water resources, the food supply will continue to grow if productivity grows quickly enough. Productivity per acre may increase when farmers apply more fertilizer, or use more labor. Productivity can also increase because of new technology, such as new seed varieties.

Population, prosperity, pollution, and productivity interact with each other in complex ways. Some examples of these interactions:

- As population grows, urban and industrial water users compete with agriculture for scarce water.
- Population growth slows as people become more prosperous.
- As agricultural productivity increases, economic prosperity improves for the entire economy.
- Increased use of agricultural chemicals may improve productivity while harming the environment.

Government policies can influence the long-term supply-and-demand balance of food. However, the complexity of these interactions illustrates how difficult it can be to decide among various policy alternatives. Appropriate policy changes are the subject of the last part of this book.

The Main Nutrition Policy Alternatives

Part 3 of the book focuses on policy interventions that may help alleviate the world hunger problem. For the most part, the policy interventions we examine are aimed at the factors identified in Part 2. Undernutrition can be reduced by increasing hungry people's access to food.

The most important actions a government can take to alleviate malnutrition are to promote general economic growth and to promote agricultural research. These contribute significantly to a second tier of government objectives: reducing population growth and maintaining or improving natural resource quality. Governments have repeatedly attempted to address the world food problem by regulating prices or by redistributing food between rich and poor countries or by food distribution programs aimed at the poor, but have been largely unsuccessful.

Part 4 then provides an analytical framework for looking into the future. What are reasonable assumptions about the underlying forces influencing the extent of world hunger? What might the world food problem look like in the year 2050?