

WHO WILL FEED CHINA?

Wake-Up Call for a Small Planet

Lester R. Brown

The Worldwatch Environmental Alert Series
Linda Starke, Series Editor

W · W · NORTON & COMPANY
NEW YORK LONDON

1

Overview: The Wake-Up Call

We often hear that the entire world cannot reasonably aspire to the U.S. standard of living or that we cannot keep adding 90 million people a year indefinitely. Most people accept these propositions. Intuitively, they realize that there are constraints, that expanding human demand will eventually collide with the earth's natural limits.

Yet, little is said about what will actually limit the growth in human demands. Increasingly, it looks as though our ability to expand food production fast enough will be one of the earlier constraints to emerge. This is most immediately evident with oceanic fisheries, nearly all of which are being pushed to the limit and beyond by human demand. Water scarcity is now holding back growth in food production on every continent.

Agronomic limits on the capacity of available crop varieties to use additional fertilizer effectively are also slowing growth in food production.

Against this backdrop, China may soon emerge as an importer of massive quantities of grain—quantities so large that they could trigger unprecedented rises in world food prices. If it does, everyone will feel the effect, whether at supermarket checkout counters or in village markets. Price rises, already under way for seafood, will spread to rice, where production is constrained by the scarcity of water as well as land, and then to wheat and other food staples. For the first time in history, the environmental collision between expanding human demand for food and some of the earth's natural limits will have an economic effect that will be felt around the world.

It will be tempting to blame China for the likely rise in food prices, because its demand for food is exceeding the carrying capacity of its land and water resources, putting excessive demand on exportable supplies from countries that are living within their carrying capacities. But China is only one of scores of countries in this situation. It just happens to be the largest and, by an accident of history, the one that tips the world balance from surplus to scarcity.

Analysts of the world food supply/demand balance have recognized that the demand for food in China would climb dramatically as industrialization accelerated and incomes rose. They have also assumed that rapid growth in food production in China would continue indefinitely. But on this latter front, a closer look at what happens when a country is already densely populated before it industrializes leads to a very different conclusion. In this situation, rapid industrialization inevitably leads to a heavy loss of cropland, which can

override any rises in land productivity and lead to an absolute decline in food production.

Historically, there appear to be only three other countries that were densely populated in agronomic terms before industrializing—Japan, South Korea, and Taiwan. The common experience of these three gives a sense of what to expect as industrialization proceeds in China. For instance, the conversion of grainland to other uses, combined with a decline in multiple cropping in these countries over the last few decades, has cost Japan 52 percent of its grain harvested area, South Korea 46 percent, and Taiwan 42 percent.¹

As cropland losses accelerated, they soon exceeded rises in land productivity, leading to steady declines in output. In Japan, grain production has fallen 32 percent from its peak in 1960. For both South Korea and Taiwan, output has dropped 24 percent since 1977, the year when, by coincidence, production peaked in both countries. If China's rapid industrialization continues, it can expect a similar decline.²

While production was falling, rising affluence was driving up the overall demand for grain. As a result, by 1994, the three countries were collectively importing 71 percent of their grain. (See Figure 1-1.)³

Exactly the same forces are at work in China as its transformation from an agricultural to an industrial society progresses at a breakneck pace. Its 1990 area of grainland per person of 0.08 hectares is the same as that of Japan in 1950, making China one of the world's most densely populated countries in agronomic terms. If China is to avoid the decline in production that occurred in Japan, it must either be more effective in protecting its cropland (which will not be easy, given Japan's outstanding record) or it must raise grain yield

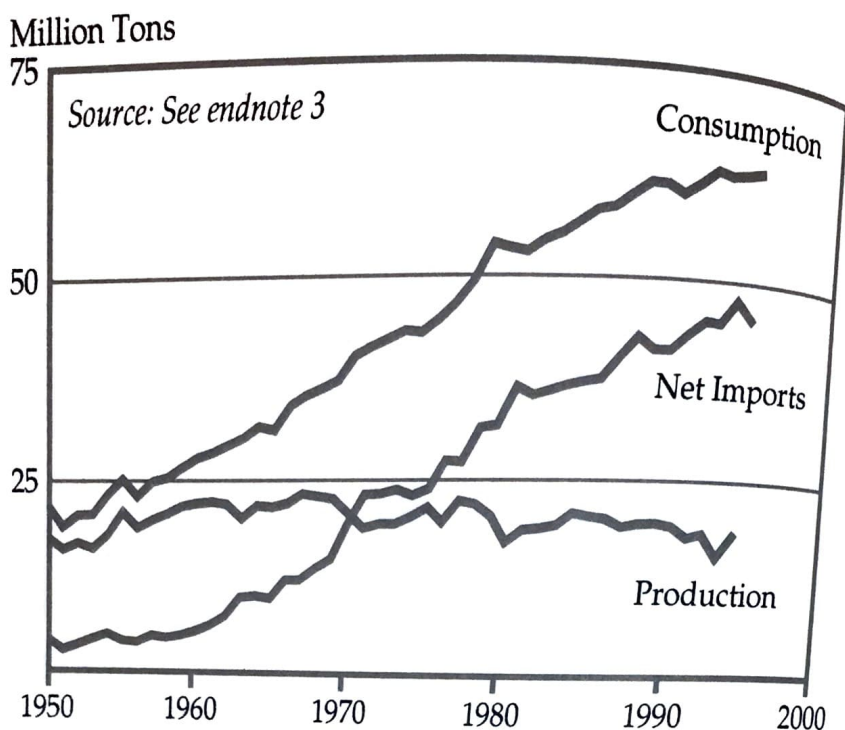


FIGURE 1-1. Combined Grain Production, Consumption, and Trade for Japan, South Korea, and Taiwan, 1950-94

per hectare faster during the next few decades than Japan has in the last few—an equally daunting task, considering the Japanese performance and the fact that China's current yields are already quite high by international standards.⁴

Building the thousands of factories, warehouses, and access roads that are an integral part of the industrialization process means sacrificing cropland. The modernization of transportation also takes land. Cars and trucks—with sales of 1.3 million in 1992 expected to approach 3 million a year by the decade's end—will claim a vast area of cropland for roads and parking lots. The combination of continually expanding population and a shrinking cropland base will further reduce the already small area of cropland per person.⁵

At issue is how much cropland will be lost and how

fast. Rapid industrialization is already taking a toll, as grain area has dropped from 90.8 million hectares in 1990 to an estimated 85.7 million in 1994. This annual drop of 1.26 million hectares, or 1.4 percent—remarkably similar to the loss rates of China's three smaller neighbors in their industrialization heyday—is likely to endure as long as rapid economic growth continues.⁶

China faces another threat to its food production that its three smaller neighbors did not. Along with the continuing disappearance of farmland, it is also confronted by an extensive diversion of irrigation water to nonfarm uses—an acute concern in a country where half the cropland is irrigated and nearly four fifths of the grain harvest comes from irrigated land. With large areas of north China now experiencing water deficits, existing demand is being met partly by depleting aquifers. Satisfying much of the growing urban and industrial demand for water in the arid northern half of the country will depend on diversions from irrigation.⁷

That China's grain production might fall in absolute terms comes as a surprise to many. This is not the result of agricultural failure but of industrial success. Indeed, China's record in agriculture is an exceptional one. Between 1950 and 1994, grain production increased nearly fourfold—a phenomenal achievement. After the agricultural reforms in 1978, output climbed in six years from scarcely 200 million tons to 300 million tons. With this surge, China moved ahead of the United States to become the world's leading grain producer. (See Figure 1-2.)⁸

Another way of evaluating China's agricultural record is to compare it with that of India, the world's second most populous country. Per capita grain production in China, which was already somewhat higher than in

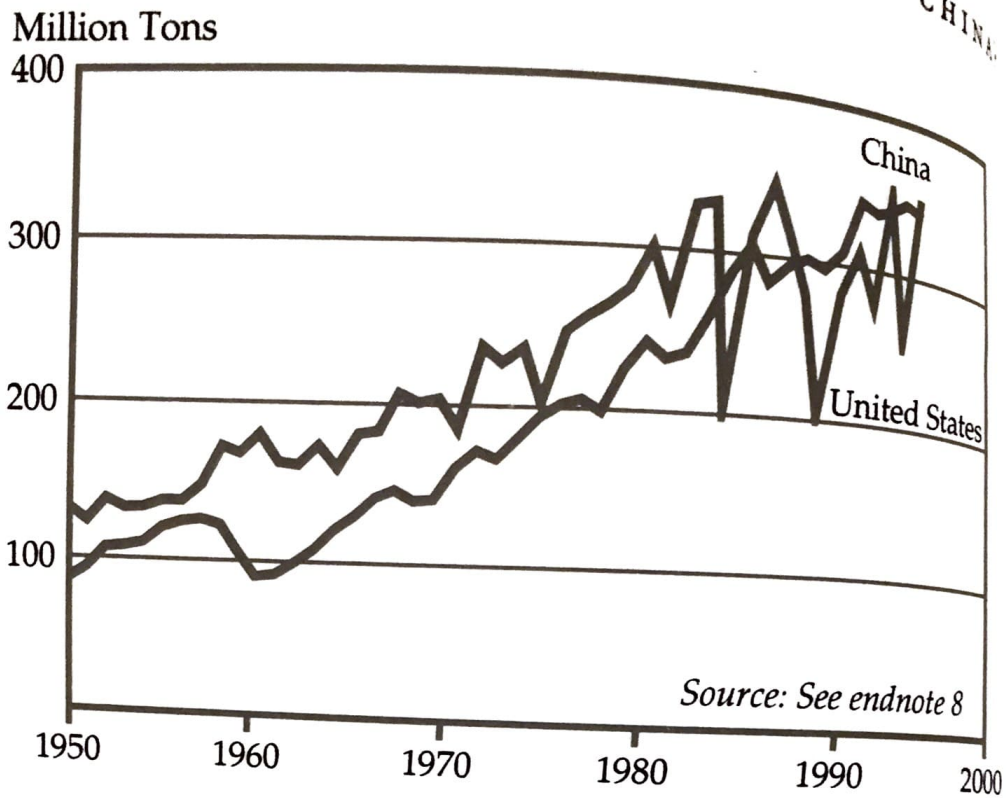


FIGURE 1-2. Grain Production, United States and China, 1950-94

India, climbed sharply after agricultural reforms were launched in 1978, opening an impressive margin over its Asian neighbor. (See Figure 1-3.)⁹

Between 1978 and 1984, China did what many analysts thought was impossible: In just six years, it raised annual grain production from roughly 200 kilograms per person to nearly 300 kilograms. At 200 kilograms, almost all grain is needed to maintain a minimal level of physical activity; an additional 100 kilograms a year opens the way for converting some grain into pork, poultry, and eggs. The immediate challenge facing China is not averting starvation, for it has established a wide margin between its current consumption level of 300 kilograms and the subsistence level. Rather, the challenge is to maintain price stability in the face of soaring demand for food driven by unprecedented advances in income.¹⁰

While China's food production capacity is starting to

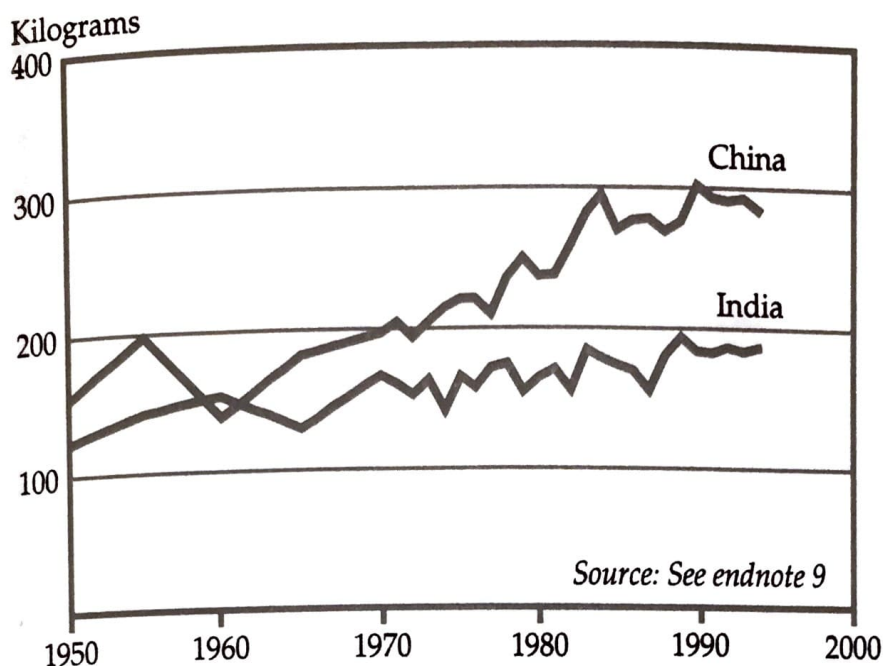


FIGURE 1-3. *Grain Production Per Person, China and India, 1950-94*

erode as a result of its breathtaking pace of industrialization, its demand for food is surging. The country is projected to add 490 million people between 1990 and 2030, swelling its population to 1.6 billion—the equivalent of adding four Japans. Because China's population is so large, even a slow rate of growth means huge absolute increases. Yet these increases are only the beginning of the story.¹¹

Even as population expands, incomes are rising at an unprecedented rate. Economic growth of 13 percent in 1992 and again in 1993, of 11 percent in 1994, and of an estimated 10 percent in 1995 adds up to a phenomenal 56-percent expansion of the Chinese economy in just four years. Never before have incomes for so many people risen so quickly.¹²

This rapid economic expansion promises to push demand for food up at a record rate. When Western

Europe, North America, and Japan began establishing modern consumer economies after World War II, they were home to some 340 million, 190 million, and 100 million people, respectively. By contrast, China is entering the same stage with a population of 1.2 billion and an economy that is expanding twice as fast. If its rapid economic growth continues, China could within the next decade overtake the United States as the world's largest economy.¹³

Past experience has not prepared us well for assessing the scale of China's future food demand. Multiplying 1.2 billion times anything is a lot. Two more beers per person in China would take the entire Norwegian grain harvest. And if the Chinese were to consume seafood at the same rate as the Japanese do, China would need the annual world fish catch.

As incomes rise, one of the first things that low-income people do is diversify their diets, shifting from a monotonous fare in which a starchy staple, such as rice, supplies 70 percent or more of calories to one that includes meat, milk, and eggs. As consumption of pork, beef, poultry, eggs, milk, and other livestock products increases along with income, grain requirements rise rapidly.¹⁴

In neighboring Japan, the soaring demand for grain driven by prosperity combined with the heavy loss of cropland since mid-century to push dependence on grain imports to 72 percent of total grain consumption in 1994. These same forces are now at work in China. It is one thing for a nation of 120 million people to turn to the world market for most of its grain. But if a nation of 1.2 billion moves in this direction, it will quickly overwhelm the export capacity of the United States and other countries, driving food prices upward everywhere.¹⁵

The first signs of a growing imbalance between the demand and supply for grain in China became evident in early 1994. In February, grain prices in China's 35 major cities had jumped 41 percent over the same month in 1993. In March, driven by panic buying and hoarding, the rise continued unabated. In response, the government released 2.5 million tons of grain from stocks to check the runaway increase in prices. This calmed food markets, but only temporarily. By October, grain prices were 60 percent higher than a year earlier. More grain reserves were released, and the government banned trading in rice futures on the Shanghai Commodity Exchange. Speculators were driving futures prices upward, leading to panic among urban consumers. The 1994 inflation rate of 24 percent—the worst since modern China was created in 1949—was largely the result of rising food prices.¹⁶

Resisting the import of grain throughout most of 1994, Beijing let prices rise as much as possible to encourage farmers to stay on the land. In recent years an estimated 120 million people, mostly from the interior provinces, have left the land and moved to cities in search of high-paying jobs. This rootless, floating population, roughly the size of Japan's, wants to be part of the economic revolution. As a potential source of political instability, these migrants are a matter of deep concern in Beijing. The government is trying to maintain a delicate balance, letting the price of grain rise enough to keep farmers on the land but not so much that it creates urban unrest that could lead to political upheaval.¹⁷

Leaders in Beijing are also trying to deal with massive unemployment and underemployment, with much of the latter masked by villagers eking out a meager existence on tiny plots of marginal land. Creating enough jobs to employ productively an estimated 800 million

workers depends on maintaining double-digit or near double-digit rates of economic growth. The government opened the country up to foreign investment in part because it was the only way to get the capital and technology needed to achieve this vital goal.¹⁸

If China holds together as a country and if its rapid modernization continues, it will almost certainly follow the pattern of Japan, South Korea, and Taiwan, importing more and more grain. Its import needs may soon far exceed the exportable supply of grain at recent prices, converting the world grain economy from a buyer's market to a seller's market. (See Chapter 7.) Instead of exporters competing for markets that never seem large enough, which has been the case for most of the last half-century, importers will be fighting for supplies of grain that never seem adequate.¹⁹

In an integrated world economy, China's rising food prices will become the world's rising food prices. China's land scarcity will become everyone's land scarcity. And water scarcity in China will affect the entire world.

In short, China's emergence as a massive grain importer will be the wake-up call that will signal trouble in the relationship between ourselves, now numbering 5.7 billion, and the natural systems and resources on which we depend. It may well force a redefinition of security, a recognition that food scarcity and the associated economic instability are far greater threats to security than military aggression is. The chapters that follow analyze this transformation, explaining why and how it is likely to come about.²⁰