

WHAT FOOD CRISIS?

Lo que separa la civilización de la anarquía son solo siete comidas. (Civilization and anarchy are only seven meals apart.)

—Spanish proverb

Digging into a mountain of caviar, sea urchin roe, succulent Kyoto beef, rare conger eels, truffles, and fine champagne, the leaders of the world's richest and most powerful countries shook their heads over soaring grocery prices in the developed world and spreading hunger in Africa, India, and Asia. Over an eighteen-course banquet prepared for them by sixty chefs, the eight global potentates declared, "We are deeply concerned that the steep rise in global food prices coupled with availability problems in a number of developing countries is threatening global food security. The negative impacts of this recent trend could push millions more back into poverty."¹

This statement, which followed the July 2008 meeting of the G8 (Group of Eight) nations in Hokkaido, Japan, was revelatory in several ways. The leaders of France, the United States, Russia, Britain, Germany, Canada, Italy, and Japan seemed bemused by the sudden emergence of the specter of food scarcity after decades of apparent abundance and cheap prices. This was a problem they clearly thought had been fixed.

Concealed within their response were embarrassing admissions. First, in urging major increases in global food aid, the leaders appeared to tacitly concede that wealthy countries had failed to fulfill their pledges to the United Nations's Millennium Development Goals of 2000 to fight poverty. Second, in calling on the world to reverse declining support for

agricultural development and research, they were implicitly confessing that they had let these deteriorate. Third, in demanding food security early warning systems, the G8 leaders effectively admitted that they had been caught unawares by the emerging food crisis—and didn't like it. There are few things a politician likes less than an unforeseen development, so for good measure they backhanded the United Nations Food and Agriculture Organization (FAO), demanding its "thorough reform," presumably for the sin of having failed to get their attention with its previous warnings.²

The "Blessings of the Earth and the Sea Social Dinner" for the G8 leaders, hosted by the government of Japan, had more than a touch of the fall of the Roman Empire about it. The Earth's eight most powerful leaders and their partners regaled themselves on cornbread stuffed with caviar, smoked salmon, and sea urchin roe; hot onion tart and winter lily bulbs followed by kelp-flavored cold Kyoto beef with asparagus dressed with sesame cream; diced fatty tuna flesh with avocado, shiso, and jellied soy sauce; boiled clam, tomato, and shiso in jellied clear soup; water shield and pink conger dressed with a vinegary soy sauce; boiled prawn with jellied tosazu vinegar; grilled eel rolled in burdock; sweet potato; and fried and seasoned goby with soy sauce and sugar. This beginning was followed by a bisque of hairy crab and salt-grilled bighead thornyhead with vinegar-pepper sauce. The main course was poele of milk-fed lamb flavored with aromatic herbs and mustard, as well as roasted lamb with black truffle and pine seed oil sauce. This was followed by a special cheese selection with lavender honey and caramelized nuts, and then a whimsical "G8 fantasy dessert" and coffee with candied fruits and vegetables. The food was accompanied by *Le Rêve grand cru/La Seule Gloire* champagne; a sake wine, *Isojiman Junmai Daiginjo Nakadori*; *Corton-Charlemagne 2005* (France); *Ridge California Monte Bello 1997*; and *Tokaji Esszencia 1999* (Hungary).³ The cost of holding the G8 summit (five hundred million dollars) could have fed for a week the additional one hundred million people left hungry by the emerging food crisis.⁴

With eloquent symbolism, this Petronian banquet made clear that the well-off part of humanity has largely forgotten what it is to go hungry and is awakening to an unpleasant shock: starvation and the wars, refugee crises, and collapse of nation-states that often accompany hunger have not been permanently banished after all. Indeed, they are once more at our doorstep. Food insecurity and its deadly consequences are again a pressing concern for every nation and each individual.

Despite the global food crisis of 2007–8, the coming famine hasn't happened yet. It is a looming planetary emergency whose interlocked causes and deeper ramifications the world has barely begun to absorb, let alone come to grips with. Experts predict that the crisis will peak by the middle of the twenty-first century; it is arriving even faster than climate change. Yet there is still time to forestall catastrophe.

The first foreshocks were discernible soon after the turn of the millennium. In the years from 2001 to 2008 the world steadily consumed more grain than it produced, triggering rising prices, growing shortages, and even rationing and famine in poorer countries. The global stockpile of grain shrank from more than a hundred days' supply of food to less than fifty days'.⁵ It was the difference between a comfortable surplus and alarming shortages in some countries; it was accompanied by soaring prices—and the resulting fury of ordinary citizens.

It was mainly this simple fact of each year consuming slightly more than we grew that panicked the long-quiescent grain markets, triggering a cycle of price increases that sent shockwaves through consumers in all countries, governments, and global institutions such as the United Nations, its FAO, and the World Bank. All of a sudden, food security, having been off the political menu for decades, was heading the bill of fare—not even to be entirely eclipsed by the spectacular crash of the world's financial markets that followed soon afterward.

That the world was suddenly short of food—after almost a half century of abundance, extravagant variety, year-round availability, and the cheapest real food prices enjoyed by many consumers in the whole of human history—seemed unimaginable. On television, celebrity chefs extolled the virtue of devouring animals and plants increasingly rare in the wild; magazines larded their pages with mouth-watering recipes to tempt their overfed readers' jaded appetites; food corporations churned out novel concoctions of salt, sugar, fat, emulsifier, extender, and dye; fast-food outlets disgorged floods of dubious nutrition to fatten an already overweight 1.4 billion people. And, in the third world, nearly fifteen thousand children continued to die quietly and painfully each day from hunger-related disease.⁶

“A brutal convergence of events has hit an unprepared global market, and grain prices are sky high. The world's poor suffer most,” stated the *Washington Post*. “The food price shock now roiling world markets is destabilizing governments, igniting street riots and threatening to send a new wave of hunger rippling through the world's poorest nations. It is outpacing even the Soviet grain emergency of 1972–75, when world

food prices rose 78 percent.” Between 2005 and 2008, food prices rose on average by 80 percent, according to the FAO.⁷

“Rocketing food prices—some of which have more than doubled in two years—have sparked riots in numerous countries recently,” *Time* magazine reported. “Millions are reeling . . . and governments are scrambling to staunch a fast-moving crisis before it spins out of control. From Mexico to Pakistan, protests have turned violent.” *Time* attributed events to booming demand from newly affluent Chinese and Indian consumers, freak weather events that had reduced harvests, the spike in oil prices, and growth in the production of farm biofuels.⁸

In early 2007, thousands of Mexicans turned out on the streets in protest over the “tortilla crisis”—savage increases in the cost of maize flour. Over the ensuing months food riots or public unrest over food prices were reported by media in Haiti, Malaysia, Indonesia, the Philippines, Bangladesh, India, Burkina Faso, Senegal, Cameroon, Morocco, Mauritania, Somalia, Ethiopia, Madagascar, Kenya, Egypt, Ivory Coast, Yemen, the United Arab Emirates, Mexico, and Zimbabwe. In Haiti riots forced the resignation of the prime minister and obliged the United Nations World Food Programme to provide emergency aid to 2.3 million people. The new government of Nepal tottered. Mexico announced plans to freeze the prices of 150 staple foods. The U.K. *Guardian* reported riots in fifteen countries; the *New York Times* and the World Bank both said thirty. The FAO declared that thirty-seven countries faced food crises due to conflict or disaster at the start of 2008, adding that 1.5 billion people living in degraded lands were at risk of starvation. The *Economist* magazine succinctly labeled it a “silent tsunami.”⁹

The rhetoric reflected the sudden, adventitious nature of the crisis. “It is an apocalyptic warning,” pronounced Tim Costello, the Australian head of the aid agency World Vision. “Until recently we had plenty of food: the question was distribution. The truth is because of rising oil prices, global warming and the loss of arable land, all countries that can produce food now desperately need to produce more.”¹⁰

“What we are witnessing is not a natural disaster—a silent tsunami or a perfect storm. It is a man-made catastrophe,” the World Bank group president Robert Zoellick advised the G8 leaders feasting in Japan. Major rice-growing countries, including India, Vietnam, China, and Cambodia, imposed export restrictions to curb rice price inflation at home. Malaysia, Singapore, Sri Lanka, and the Philippines began stockpiling grain while Pakistan and Russia raised wheat export taxes and Brazil,

Indonesia, and Argentina imposed export restrictions. Guinea banned all food exports.¹¹

The panic reached a peak in Asia, where rice prices soared by almost 150 percent in barely a year. “Nobody has ever seen such a jump in the price of rice,” said sixty-eight-year-old Kwanchai Gomez, the executive director of the Thai Rice Foundation. Filipino fast-food outlets voluntarily reduced customer portions by half. In Thailand, thieves secretly stripped rice paddies by night to make a fast profit. India banned the export of all non-basmati rice, and Vietnam embargoed rice exports, period, sending Thai rice prices spiraling upward by 30 percent. The giant U.S. retailer Wal-Mart rationed rice sales to customers of its Sam’s Club chain; some British retailers did likewise. Such measures did little to quell the panic, which was originally touched off by a 50 percent drop in surplus rice stocks over the previous seven years. The International Rice Research Institute attributed the crisis to loss of land to industrialization and city sprawl, the growing demand for meat in China and India, and floods or bad weather in Indonesia, Bangladesh, Vietnam, China, and Burma.¹²

By mid-2009, accelerated by the worldwide financial crash, thirty-three countries around the world were facing either “alarming” or “extremely alarming” food shortages, a billion people were eating less each day¹³—and most of Earth’s citizens were feeling the pinch. Though food prices fell, alongside prices of stocks and most other commodities, in the subsequent months, they fell only a little—and then began to rise again.

What happened in 2008 wasn’t the coming famine of the twenty-first century, merely a premonition of what lies ahead. This will not be a single event, affecting all nations and peoples equally at all times, but in one way or another it will leave no person in the world untouched. The reemergence of food scarcity occurs after decades of plenty, accompanied by the lowest real food prices for consumers in history. These bounteous years were the consequence of a food production miracle achieved by the world’s farmers and agricultural scientists from the 1960s on—a miracle of which the urbanized world of today seems largely oblivious and which we have forgotten to renew.

By the early twenty-first century, signs of complacency were in evidence. In 2003, a conference of the Consultative Group on International Agricultural Research in Nairobi was told, “According to the Food and Agriculture Organization of the United Nations, the number of food-insecure people in developing countries fell from 920 million in 1980 to

799 million in 1999.” Even in the immediate aftermath of the 2008 food price spike, the FAO itself, along with the Organization for Economic Cooperation and Development, remarked, “the underlying forces that drive agricultural product supply (by and large productivity gains) will eventually outweigh the forces that determine stronger demand, both for food and feed as well as for industrial demand, most notably for biofuel production. Consequently, prices will resume their decline in real terms, though possibly not by quite as much as in the past.”¹⁴

For some years, reassuring statements such as these had been repeatedly aired in the food policy, overseas aid, and research worlds. Unintentionally, food scientists and policy makers were sending a signal to governments and aid donors around the world that implied, “Relax. It’s under control. We’ve fixed the problem. Food is no longer critical.” Not surprisingly, aid donors rechanneled scarce funds to other urgent priorities—and growth in crop yields sagged as the world’s foot came off the scientific accelerator.

Many found the new crisis all the more mysterious for its apparent lack of an obvious trigger. Various culprits were pilloried by blame-seeking politicians and media. Biofuels, after being talked up as one of the great hopes for combating climate change, quickly became a villain accused of “burning the food of the poor,” and from China to Britain, countries slammed the brakes on policies intended to encourage farmers to grow more “green fuel” from grain. According to the World Bank, biofuels could have caused as much as three-quarters of the hike in food prices. Equally to blame, according to other commentators, were oil prices, which had soared sixfold in the five years from mid-2003 to mid-2008 (although they fell again sharply as the global recession bit deep), with severe consequences for the cost of producing food, through their impact on farmers’ fuel, fertilizer, pesticide, and transportation costs. In developed countries the financial pain was high, but in developing nations it was agony: farmers simply could not afford to buy fertilizer, and crop yields began to slip. In Thailand rice farmers quietly parked their new but unaffordable tractors in their sheds and went back to plowing with buffalo; buffalo breeders experienced a bonanza. “Energy and agricultural prices have become increasingly intertwined,” commented Joachim von Braun, the head of the International Food Policy Research Institute. “High energy prices have made agricultural production more expensive by raising the cost of cultivation, inputs—especially fertilizers and irrigation—and transportation of inputs and outputs. In poor countries, this hinders production response to high output prices. The main

new link between energy and agricultural prices, however, is the competition of grain and oilseed land for feed and food, versus their use for bio energy.”¹⁵

Speculators, fleeing crumbling financial markets and discovering an unlikely haven in booming agricultural commodities, were a favorite target of media ire: “Food was becoming the new gold. Investors fleeing Wall Street’s mortgage-related strife plowed hundreds of millions of dollars into grain futures, driving prices up even more. By Christmas (2007), a global panic was building,” reported the *Washington Post*. In developing nations, traders and grain dealers were accused of buying up surplus stocks and hoarding them to drive the prices higher still. In the Philippines the government threatened hoarders with charges of economic sabotage and sent armed soldiers to supervise the distribution of subsidized grain.¹⁶ Retirement and hedge funds, casting about for something to invest in that wasn’t going to hell in a handbasket, also jumped on farm commodities and even agribusiness enterprises—areas such investors traditionally shun.

Many saw the crisis as simply a result of the growth of human population, the inexorable climb from 3 billion people in 1960 to 6.8 billion by 2008—the hundred million more mouths we have to feed in each succeeding year. Others ascribed it chiefly to burgeoning appetites in China and India, which had in a matter of five years or so together added the consumer equivalent of Europe to global demand for food as their emergent middle classes indulged in the delights of diets containing far more meat, poultry, dairy, and fish than ever before. In China, meat consumption trebled in less than fifteen years, requiring a tenfold increase in the grain needed to feed the animals and fish. One way to visualize the issue is that growth in global food production of 1–1.5 percent a year has more or less kept pace with growth in population—but has fallen short of meeting the growth in demand. One explanation for this is that farmers around the world have not responded by increasing the area of land they plant and harvest or raising their crop yields so rapidly as in the past. The big question is: why?

Some blamed the weather. Portentously, many were quick to discern the looming shadow of climate change in the run of droughts, floods, and other natural mishaps that had disrupted global farm production across most continents in recent years. In eastern Australia a ten-year drought slashed grain production and all but obliterated the rice industry; the unprecedented draining of Australia’s food bowl, the Murray-Darling Basin, threatened to eliminate fruit, vegetable, and livestock industries

reliant on irrigation. Similar hardship faced producers across sub-Saharan Africa. Floods in China and along the Mississippi River wreaked local havoc with grain production. In Burma, Cyclone Nargis flattened the Irrawaddy Delta rice crop, propelling Asian prices into a fresh spiral. Heat waves in California and torrential rains in India added to perceptions—heightened by media reportage—that the climate was running amok.¹⁷

Other commentators sought villains among the world's governments, blaming protectionism and hidden trade barriers, farm subsidies, food price controls or taxes, environmental and health restrictions, the ensnaring of farmers in snarls of red tape, along with the perennial failure of trade negotiators to open up global trade in agricultural products. Supermarkets and globalization of the food trade came in for flak, especially from the political left and from farmers themselves, for driving down farm commodity prices and thus discouraging growers from increasing production. Economic observers read the crisis as primarily due to weaker growth in food production at a time of strong growth in consumer demand, especially in China and India and among affluent populations worldwide.¹⁸

The Green Revolution, whose technologies had delivered the last great surge in global food production in the 1970s and 1980s, seemed to be fizzling out, a view supported by the disturbing slide in crop yield advances. Yields of the major crops of wheat, maize, and rice had once increased by as much as 5 and even 10 percent a year—now they were increasing by 1 percent or nothing at all. In the overheated economy of the early twenty-first century, farm costs had soared along with oil prices, hindering farmers from adopting newer, but costlier and more energy-intensive, technologies. In advanced countries, some scientists whispered, we might actually be approaching the physical limits of the ability of plants to turn sunlight into edible food.

In the general hunt for someone to blame for the short-term food crisis, a more profound truth was being obscured—that the challenge is far deeper, longer-term, and more intractable than most people, and certainly most governments, understand. It stems from the magnifying and interacting constraints on food production generated as civilization presses harder against the finite bounds of the planet's natural resources, combined with human appetites that seem to know no bounds.

This challenge is more pressing even than climate change. A climate crisis may emerge over decades. A food crisis can explode within weeks—and kill within days. But the two are also interlocked. “If the world were

to experience a year of bad weather similar to that experienced in 1972, the current ‘food crisis’ would pale in comparison to the crisis that would arise as a result. This should be taken as a warning that advance planning ought to be done if total chaos is to be avoided,” observes the resource analyst Bruce Sundquist.¹⁹

The character of human conflict has also changed: since the early 1990s, more wars have been triggered by disputes over food, land, and water than over mere political or ethnic differences. This should not surprise us: people have fought over the means of survival for most of history. But in the abbreviated reports on the nightly media, and even in the rarefied realms of government policy, the focus is almost invariably on the players—the warring national, ethnic, or religious factions—rather than on the play, the deeper subplots building the tensions that ignite conflict. Caught up in these are groups of ordinary, desperate people fearful that there is no longer sufficient food, land, and water to feed their children—and believing that they must fight “the others” to secure them. At the same time, the number of refugees in the world doubled, many of them escaping from conflicts and famines precipitated by food and resource shortages. Governments in troubled regions tottered and fell.

The coming famine is planetary because it involves both the immediate effects of hunger on directly affected populations in heavily populated regions of the world in the next forty years—and also the impacts of war, government failure, refugee crises, shortages, and food price spikes that will affect all human beings, no matter who they are or where they live. It is an emergency because unless it is solved, billions will experience great hardship, and not only in the poorer regions. Mike Murphy, one of the world’s most progressive dairy farmers, with operations in Ireland, New Zealand, and North and South America, succinctly summed it all up: “Global warming gets all the publicity but the real imminent threat to the human race is starvation on a massive scale. Taking a 10–30 year view, I believe that food shortages, famine and huge social unrest are probably the greatest threat the human race has ever faced. I believe future food shortages are a far bigger world threat than global warming.”²⁰

The coming famine is also complex, because it is driven not by one or two, or even a half dozen, factors but rather by the confluence of many large and profoundly intractable causes that tend to amplify one another. This means that it cannot easily be remedied by “silver bullets” in the form of technology, subsidies, or single-country policy changes, because of the synergetic character of the things that power it.

To see where the answers may lie, we need to explore each of the main drivers. On the demand side the chief drivers are:

Population. Although the rate of growth in human numbers is slowing, the present upward trend of 1.5 percent (one hundred million more people) per year points to a population of around 9.2 billion in 2050—3 billion more than in 2000. Most of this expansion will take place in poorer countries and in tropical/subtropical regions. In countries where birth rates are falling, governments are bribing their citizens with subsidies to have more babies in an effort to address the age imbalance.

Consumer demand. The first thing people do as they climb out of poverty is to improve their diet. Demand for protein foods such as meat, milk, fish, and eggs from consumers with better incomes, mainly in India and China but also in Southeast Asia and Latin America, is rising rapidly. This in turn requires vastly more grain to feed the animals and fish. Overfed rich societies continue to gain weight. The average citizen of Planet Earth eats one-fifth more calories than he or she did in the 1960s—a “food footprint” growing larger by the day.

Population and demand. This combination of population growth with expansion in consumer demand indicates a global requirement for food by 2050 that will be around 70–100 percent larger than it is today.²¹ Population and demand are together rising at about 2 percent a year, whereas food output is now increasing at only about 1 percent a year.

These demand-side factors could probably be satisfied by the world adopting tactics similar to those of the 1960s, when the Green Revolution in farming technology was launched, were it not for the many constraints on the supply side that are now emerging to hinder or prevent such a solution:

Water crisis. Put simply, civilization is running out of freshwater. Farmers presently use about 70 percent of the world’s readily available freshwater to grow food. However, megacities, with their huge thirst for water for use in homes, industry, and waste disposal, are increasingly competing with farmers for this finite resource and, by 2050, these uses could swallow half or more of the world’s available freshwater at a time when many rivers, lakes,

and aquifers will be drying up.²² Unless major new sources or savings are found, farmers will have about half of the world's currently available freshwater with which to grow twice the food.

Land scarcity. The world is running out of good farmland. A quarter of all land is now so degraded that it is scarcely capable of yielding food. At the same time, cities are sprawling, smothering the world's most fertile soil in concrete and asphalt, while their occupants fan out in search of cheap land for recreation that diverts the best food-producing areas from agriculture. A third category of land is poisoned by toxic industrial pollution. Much former urban food production has now ceased. The emerging global dearth of good farmland represents another severe limit on increasing food production.

Nutrient losses. Civilization is hemorrhaging nutrients—substances essential to all life. Annual losses in soil erosion alone probably exceed all the nutrients applied as fertilizer worldwide. The world's finite nutrient supplies may already have peaked. Half the fertilizer being used is wasted. In most societies, up to half the food produced is trashed or lost; so too are most of the nutrients in urban waste streams. The global nutrient cycle, which has sustained humanity throughout our history, has broken down.

Energy dilemma. Advanced farming depends entirely on fossil fuels, which are likely to become very scarce and costly within a generation. At present farmers have few alternative means of producing food other than to grow fuel on their farms—which will reduce food output by 10–20 percent. Many farmers respond to higher costs simply by using less fertilizer or fuel—and so cutting yields. Driven by high energy prices and concerns about climate change, the world is likely to burn around 400 million tonnes (441 million U.S. tons) of grain as biofuels by 2020²³—the equivalent of the entire global rice harvest.

Oceans. Marine scientists have warned that ocean fish catches could collapse by the 2040s due to overexploitation of wild stocks.²⁴ Coral reefs—whose fish help feed about five hundred million people—face decimation under global warming. The world's oceans are slowly acidifying as carbon dioxide from the burning of fossil fuels dissolves out of the atmosphere, threatening ocean food chains. Fish farms are struggling with pollution and sediment runoff from the land. The inability of the fish sector to meet

its share of a doubling in world food demand will throw a heavier burden onto land-based meat industries.

Technology. For three decades the main engine of the modern food miracle, the international scientific research that boosted crop yields, has been neglected, leading to a decline in productivity gains. Farmers worldwide are heading into a major technology pothole, with less new knowledge available in the medium run to help them to increase output.

Climate. The climate is changing: up to half the planet may face regular drought by the end of the century. “Unnatural disasters”—storms, floods, droughts, and sea-level rise—are predicted to become more frequent and intense, with adventitious impacts on food security, refugee waves, and conflict.

Economics, politics, and trade. Trade barriers and farm subsidies continue to distort world markets, sending the wrong price signals to farmers and discouraging investment in agriculture and its science. The globalization of food has helped drive down prices received by farmers. Speculators have destabilized commodity markets, making it riskier for farmers to make production decisions. Some countries discourage or ban food exports and others tax them, adding to food insecurity. Others pay their farmers to grow fuel instead of food. A sprawling web of health, labor, and environmental regulation is limiting farmers’ freedom to farm.

The collapse in world economic conditions in late 2008 and 2009 has changed the prices of many things, including land, food, fuel, and fertilizer—but has not altered the fact that demand for food continues to grow while limits on its production multiply. Indeed, the economic crash exacerbated hunger among the world’s poor, and has not altered the fundamentals of climate change, water scarcity, population growth, land degradation, or nutrient or oil depletion.

In early 2009 a report by Chatham House, a think tank focused on international affairs, observed that a lower food price “does not mean that policy-makers around the world can start to breathe a sigh of relief. . . . [E]ven at their somewhat diminished levels current prices remain acutely problematic for low-income import-dependent countries and for poor people all over the world. The World Bank estimates that higher food prices have increased the number of undernourished people by as much as 100 million from its pre-price-spike level of 850 million.”²⁵

In the medium and longer term, the report warned, food prices were poised to rise again. “Although many policy-makers have taken a degree of comfort from a recent OECD-FAO report on the world’s agricultural outlook to 2017 . . . the report largely overlooked the potential impact of long-term resource scarcity trends, notably climate change, energy security and falling water availability.”²⁶

To sum it all up, the challenge facing the world’s 1.8 billion women and men who grow our food is to double their output of food—using far less water, less land, less energy, and less fertilizer. They must accomplish this on low and uncertain returns, with less new technology available, amid more red tape, economic disincentives, and corrupted markets, and in the teeth of spreading drought. Achieving this will require something not far short of a miracle.

Yet humans have done it before and, resilient species that we are, we can do it again. This time, however, it won’t just be a problem for farmers, scientists, and policy makers. It will be a challenge involving every single one of us, in our daily lives, our habits, and our influence at the ballot box and at the supermarket.

It will be the greatest test of our global humanity and our wisdom we have yet faced.