

# **Food Failures and Futures**

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In the wake of Cyclone Nargis, which may claim upwards of 100,000 lives immediately in Myanmar, formerly known as Burma, and far more in coming months, the world food crisis has worsened. Millions of tons of food will be needed to feed the estimated 1.5 million now-homeless Burmese. United Nations experts reckon some 2,000 square miles of prime Burmese farmland is now underwater, devastating rice production.

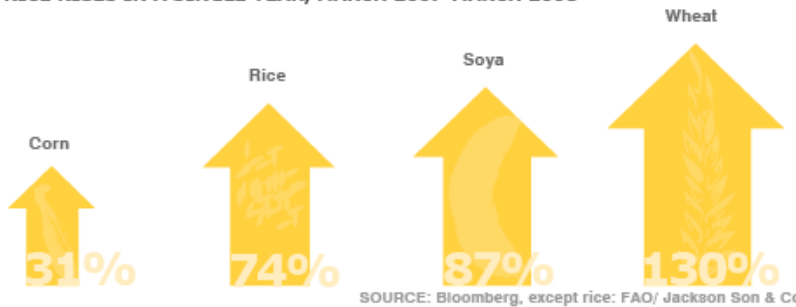
The world was counting on Myanmar to produce and export 600,000 tons of rice this year, most of which would go to rice-starved Bangladesh and Sri Lanka. Overall, Myanmar was expected to produce about eighteen million tons of rice in 2008, more than sufficient to feed its people and export to the global marketplace. The virtual certainty that Myanmar will now not only fail to export any rice, but become a rice importer, raises the specter that Cyclone Nargis will indirectly cause the slow starvation of tens of thousands more people, further exacerbating the global food crisis.

Commodity markets have been bumping the price of rice upward steadily since Cyclone Nargis struck the shores of Myanmar. The price of bulk rice jumped 8.3 percent over the first two weeks of May, and is expected to continue rising throughout the year, fueled by commodity speculation, unusual demand, and now what may well turn out to be a natural catastrophe that will dwarf the scale of the 2004 tsunami.

The soaring prices of food—especially rice, wheat, and corn—have international organizations and rich-country governments scrambling for immediate solutions, in hopes of staving off mass starvation. In April 2008, the World Bank predicted that without intervention some one hundred million people this year face famine. Bank President Robert B. Zoellick said that “For two billion people, high food prices are now a matter of daily struggle, sacrifice, and for too many, even survival. We estimate that already some one hundred million people may have been pushed into poverty as a result of high prices over the last two years.” The specter of famines, food lines, and riots haunts planning for the upcoming G8 Summit in Japan, the annual World Health Assembly in Geneva, and the U.S. presidential elections. It has propelled action from the office of UN secretary-general Ban Ki-moon, including the creation of a new, high-level UN coordinating body meant to orchestrate coherent, rapid response across agencies.

Since the end of the Cold War three types of events have proven capable of mobilizing mass outpourings of popular global response: heinous human rights violations

**PRICE RISES IN A SINGLE YEAR, MARCH 2007-MARCH 2008**



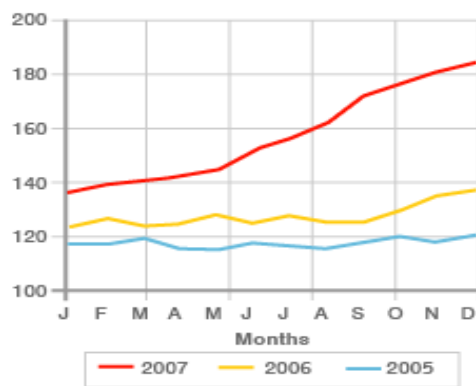
(Darfur), catastrophes (tsunami), and famines. In each case the events have proven capable of sweeping actions rapidly, faster than cool heads and

policy analysis permit. This pattern now seems likely to repeat itself.

With food riots breaking out in countries all over the world, and the public—rich and poor alike—demanding immediate steps taken, politicians may be forgiven their rush to act. The Asian Development Bank (ADB) said on May 3, 2008, that without sufficient emergency food aid to offset a crisis now facing one billion Asians, rising fuel and food costs, “could seriously undermine the global fight against poverty and erode the gains of the past decades.” The Bank estimates that 2008 GDP growth rates for Asian giants China, India, and South Korea will fall 1.4 percent; for 2009 the decline will be 4.2 percent.

**RIISING FOOD PRICES, 2005-2007**

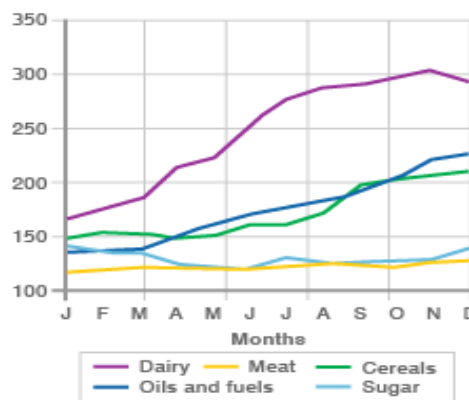
1998-2000 = 100\*



\*Changes in price are indexed against the costs dating from 1998-2000

**PRICES RISES BY FOOD TYPE, 2007**

1998-2000 = 100\*



SOURCE: Source: FAO

“The era of cheap food may be over. Rising food and fuel prices have placed many governments in the region under significant pressure to put food on the table of the poor and vulnerable,” ADB President Haruhiko Kuroda said. “The ADB will provide immediate budgetary support to the hardest-hit countries.”

Over the next twenty-four months the ADB will loan poor Asian nations one billion dollars for irrigation and mechanization of crop production. Such measures may be a windfall for countries like Thailand and Vietnam, where large-scale rice production is still possible, but it is hard to know how a densely populated nation like Bangladesh can benefit. With a population just over half that of the United States squashed into a space the size of Iowa, Bangladesh hasn't a spare millimeter of arable land. In April I found rice lines all over Bangladesh, where hungry citizens jostled with one another, sometimes violently, to snag sacks of government-subsidized rice. According to a recent Bangladeshi survey nearly half the urban population is down to one square meal a day. Rice is now so costly to the average Bangladeshi that there is no money left in the family budget for purchase of protein—chickens, eggs, milk, or highly nutritious vegetables.

Meanwhile, nations that still have strong rice production capacities, such as Thailand and Vietnam, are strictly controlling exports and negotiating the creation of a rice cartel, akin to the OPEC oil cartel. Even without such a cartel the price of a ton of Thai rice is three times higher today compared to a year ago. The ADB's Kuroda denounced such a cartel scheme, saying that, "The agriculture market should be market-driven. Any kind of cartel isn't good for the exporters and the importers." Food crisis need not be permanent if good policies are adopted.

But quick solutions will only prevent deaths and malnutrition for the few in the immediate months ahead. The crisis that is unfolding is a fundamental, structural change in the world food supply and agricultural production, clearly linked to rising energy costs, climate shifts, and the emerging Asian middle class. Unless the food crisis is addressed at that level, starvation and malnutrition will become enduring features of the global landscape, sparking instability and anxiety for decades to come.

Americans may wonder why, given the nation's historic generosity in food aid, such a crisis has seemingly suddenly emerged. Their confusion is quite understandable. The Bush administration this week called for Congress to approve a supplemental \$770 million in food aid for fiscal year (FY) 2009, bringing



the total for next year's U.S. budget to \$2.7 billion. "With the new international funding," President George W. Bush declared, "We're sending a clear message to the world that America will lead the fight against hunger for years to come."

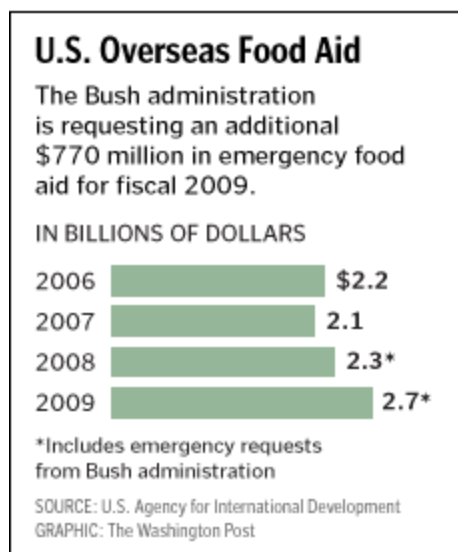
Congress is still debating allocation of prior, FY2008 emergency food aid requests, which, if appropriated, would bring this year's spending to \$2.3 billion. The Democrats think the White House has requested too little food support, so it is likely this year's total will soar. Overall, if everything goes as the White House hopes, it will mean that Americans have generously donated or committed \$9.3 billion for fiscal years 2006–2009—and likely more than \$10 billion if the congressional Democrats have their way.

Even at today's astronomical costs \$9.3 billion ought to buy sufficient sacks of grains to circumnavigate the planet a few times, laid end-on-end along the equator.

So what's the problem?

### What is "Food Aid"?

In April, the Bush administration responded to the unfolding food crisis by tapping into the American emergency crop trust—a stockpile of surplus grains—to ship 250,000 tons of wheat overseas, mostly through the World Food Program (WFP). The U.S. Drug Administration (USDA) gave that donation a cash value of \$200 million. Arguments ensued, with some humanitarian organizations insisting the United States was being parsimonious and ought to release \$600 million worth of grains from the crop trust.



Regardless of how much food aid is released, nearly 100 percent of American support is in the form of homegrown crops, *not money*. Some of this is written into U.S. laws, supported by both American political parties, stipulating that a minimum of 75 percent of all food aid must be in the form of American-grown crops, and *all* of it must be transported using U.S. ships, planes, trains, or vehicles. In other words, the cash numbers (e.g., \$9.3 billion) represent rough valuations of government payments to farmers, costs of

maintaining grain reserves, packaging, and distribution prices. The real winners in a U.S. food aid program are American agricultural companies.

These companies are not presently in need of charity. In April 2008 America's top agricultural corporations reported record profits. Cargill jumped 86 percent, realizing a quarterly profit of \$1 billion. Archer Daniels Midland (ADM) saw a 42 percent quarterly profit hike, with revenues jumping from last year's \$11.4 billion to this year's \$18.7 billion. Monsanto revenue rose 45 percent, for a \$1.4 billion increase in quarterly sales.

The United States is not alone in using aid programs to bolster domestic agriculture. According to OXFAM, 79 percent of all food aid last year from wealthy countries was delivered in the form of domestically produced surplus crops, shipped via rich-country transport mechanisms. Because of the high cost of transporting vegetables from Denmark, wheat from Canada, or dairy products from the UK, OXFAM estimates upwards of 40 percent of all food aid spending last year was eaten up by shipping and distribution costs.

The real beneficiaries of food aid, then, are the domestic food producers of Europe, Canada, the United States, and Australia and shipping giants like Maersk, Mitsui, and American President Lines. In March 2008 Denmark's AP Moller Maersk reported a 15 percent profit increase over the previous year. Mitsui jumped 12 percent. American President Lines is expected to report less grand revenue results later in May 2008, amid rising transport fuel costs.

For the donor nations, food aid—reported in currency figures though actually delivered in the form of domestically produced foodstuffs—is a win/win situation. It supports their own agricultural industries, allows them to value the foods at extremely costly European and North American marketplace prices, sends cash to their shipping industries, and saves lives overseas.

But does it *really* save lives, not just today, but for decades to come?

### **What *Doesn't* “Food Aid” Do?**

When I travel around the world's poorest countries it is striking how rarely I see tractors, grain silos, or mechanized irrigation. Most farming in places like Bangladesh, rural India, Zambia, Peru, or Uganda is still done pretty much as it was a century ago—in some

cases, millennia ago. In much of sub-Saharan Africa, for example, farming remains a woman's job, executed with hand-hoes, scythes, shovels, and prayers. The rice paddies of Asia are filled today—as they were one thousand years ago—with peasants hunched over in the blazing sun, knee-deep in muddy water, manually stabbing rice shoots into the soil. Corn is still grown across much of Latin America in tiny plots, farmed today the way they were hundreds of years ago by the Aztecs, Mayans, Olmecs, Toltecs, and Incas.

Few of the world's farmers can dream of owning a Deere 70 Series High Octane Harvesting Combine, with an air-conditioned cab, outfitted with the new 600C StalkMaster Chopping Corn Heads, capable of harvesting twelve rows of corn simultaneously propelled, as Deere puts it, by a “whopping 480 HP, more than enough to push the widest chopping header.” Heck, they can't even imagine getting their hands on a little Deere 5003 Series Tractor, with only a seventy-four horsepower engine and a shovel nose that can haul four bales of hay at a time. Even a stripped-down, used Deere 401D utility tractor goes for \$4,600 online, not including delivery.

Nina Federoff, the State Department's science and technology adviser, says there are about four hundred million farms in the world, most of them small. Despite their sizes, however, these farms could be highly productive if the growers were provided with better seed stock, fertilizers, and agricultural training. Right this minute, what the world's small farmers need are genetically modified seeds that can thrive in stressed ecologies, and a better set of basic tools. The food crisis is hitting at the same time as water resources are dwindling in much of the world—roughly two billion people now live in dehydrated settings. Farmers in such places desperately need wells, irrigation tools, and training in water conservation.

Most of the world's population is subsisting on food grown much the way crops were sown and harvested on the American prairies more than a century ago. Worldwide agricultural production suffers gaps in technology, efficiency, transport, and overall practice that span hundreds of billions of dollars, and centuries of knowledge and technical advancement. Even if most farmers living in poor countries can manage with bare hands, oxen, water buffalo, or yak (in lieu of the Deere 401D) to plow, harvest, and produce more than enough food to feed their families, transporting harvests to village marketplaces is tough enough; getting crops onto the world marketplace is impossible.

Worse, protectionist practices in the wealthy nations virtually ensure that poor countries will never manage access to the global marketplace.

Countries like Bangladesh—filled with hard-working farmers that toil from dawn to dusk—will never be able to produce sufficient food supplies to feed their own people—not with water buffaloes and human sweat. So such nations are locked in dependency mode, forced to either buy essential foods at spot market prices in international commodity exchanges, or pray for food aid from the wealthy nations. When prices rise dramatically, such countries are unable to afford to purchase as much food, and donors—which value their donated crops according to commodity indices—have fewer tons to donate for the same bragging rights back home. Whether purchased on the open market, or donated by the United States, \$200 million worth of rice is fewer tons today than it was a year ago—in much of the world it is 75 percent fewer tons.

Food dependency can only end if the aid business model changes, better reflecting the interests of farmers in Ghana or Guatemala rather than those of Cargill or French cheese makers. Genuine food aid would aim at improving the technology of agriculture, directly investing in small-scale farming operations in poor countries, provision of mechanized irrigation systems, and fair trade practices that could allow a Tanzanian corn farmer as good a chance of selling his harvest in Italy as a Canadian or Russian.

In a blistering attack on food “charity,” as he termed it, Senegal’s President Abdoulaye Wade on May 4, 2008, denounced most of the United Nations’ system of aid, all of the top humanitarian relief nongovernmental organizations (NGOs), and specifically called for the demolition of the Food and Agriculture Organization (FAO), which he described as a “bottomless pit of money largely spent on its own functioning with very little effective operations on the ground.

“Food policy—in which ‘food’ is a nice word for ‘charity’—is outdated. It should be progressively abandoned in favor of a ‘help to stand up’ policy, of help for self-assistance,” Wade continued. Instead of food handouts, Wade said, Africa needs fertilizers, pesticides, irrigation equipment, tractors, technology, and access to the global marketplace, on equal standing, for sale of its products. “We must halt this scenario which exploits the North’s altruistic character and the theme of poverty in the South, where titled distributors of aid, or improvised figures recruited to the cause ... have



managed to insert themselves between the resources and their destination and start off by largely helping themselves,” said Wade.

*The real goal of food aid should be building local agricultural capacities, bringing dependency to an end. Short-term famine relief efforts, including distribution of American- and European-grown crops, should be seen as emergency measures necessitated by failures in achievement of the larger goal, not as ends in themselves.*

Hundreds of foreign aid organizations—in the UN system, bilateral government programs, and NGOs—have tried for decades to improve agricultural production inside poor countries. But the scale of such investment has never come close to the crop-donation schemes. If the world community really wanted to see the game change, emergency aid would reflect a desire to bring more players onto the field. Shipping food, grown by subsidized farmers toiling inside rich countries, distorts local markets not only inside famine-affected countries, but across entire regions. The donated foods enter the local market at prices so low that they completely undermine regional producers. The longer-term impact of donated food, then, is to destroy all positive market incentives for local farmers. The food crisis widens, and becomes more enduring.

A far wiser course of emergency food aid would witness a mix of genuine cash and food donations to the World Food Program and humanitarian agencies, allowing them to purchase crops from local, regional producers. Similarly, cash would permit use of local distribution systems, thus bolstering regional trucking, shipping, and rail industries. Sadly, food aid in its current form only slows the pace of local shipping and agricultural development. Worse, in some places it undermines development.

Malawi is a good example. The government decided two years ago to directly subsidize seed and fertilizer costs, and corn production boomed. Malawi’s most recent harvest is its largest in history. The U.S. government decided to step in, offering free school breakfasts for 650,000 children in what was described as a \$20 million, three-year effort in collaboration with the World Food Program. What could be wrong with that? Well, because of the great bumper crop of Malawian corn, the product sells locally for about \$320/ton. Shipping in American corn, using American shippers, means those school children will get corn that costs \$812/ton. If the World Food Program got cash from America, instead, and purchased corn from local Malawian farmers, they could feed

another 400,000 children at the same price. Meanwhile, the general Malawian marketplace has a glut of corn, which is driving prices *down*, threatening the survival of local farming businesses. The institution should have been sensitized to this, as a 2002 drought in Malawi, which drove down corn production, led to a massive glut of donated corn from the United States that virtually bankrupted remaining farmers because it so deeply undermined corn prices.

#### GROCERY PRICES

Average US prices of select food staples for January of each year.

**FLOUR** (All purpose, per lb.)



**GROUND BEEF** (per lb.)



**WHOLE CHICKEN** (per lb.)



**WHOLE MILK** (per gal.)



**BUTTER** (Stick, per lb.)

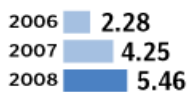


SOURCE: Bureau of Labor Statistics

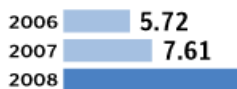
#### COMMODITY PRICES

February futures prices at the Chicago Board of Trade (\$/bushel)

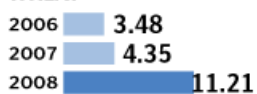
**CORN**



**SOYBEANS**



**WHEAT**



SOURCE: DTN BOSTON GLOBE

Last fall the U.S. Government Accountability Office (GAO) issued a scathing report on the efficacy of U.S. food aid, saying, “Since 2002, Congress has appropriated an average of \$2 billion per year for U.S. food aid programs, which delivered an average of four million metric tons of food commodities per year. Despite growing demand for food aid, rising business, and transportation costs have contributed to a 52 percent decline in average tonnage delivered over the last five years. These costs represent 65 percent of total emergency food aid, highlighting the need to maximize its efficiency and effectiveness.” The GAO assessment preceded recent escalations in food and energy costs, which have only worsened this paradigm.

The average American believes that ours is a generous nation, bringing alms to the dying poor. Europeans and Canadians are similarly inclined to imagine grand generosity on their governments’ parts. In truth, the picture is far more complicated, and though the stated appraisal of aid has increased, real, on-the-ground value has declined, and shoved local production aside.

Further, local real estate is a serious problem, especially in rice-starved Asia. North America is a great agricultural region in large part because its vast open spaces across the prairies, deltas, and former swamplands supported scales of farming that could compensate for capital investments (such as tractors and irrigation systems) and reap enormous profits. Few poor countries have unused arable lands. Indeed, the amount of farmland available in

the world is shrinking due to expansion of urban and exurban spaces, climate change, and water loss. For example, China is estimated to be losing up to 2 percent of its farmland annually due to these causes. In the last decade China has lost agricultural land that, taken together, is three times the size of the State of New Hampshire. China is already saddled with 20 percent of the world's mouths to feed, and less than 7 percent of the world's farmland; that dire ratio is expected to worsen by 2030, leaving China with 1.5 billion people and about 25 percent less farmland. But this is going to get much worse, as the primary pressure for devouring arable land in China is government sale of real estate in order to pay for urban infrastructures, according to a recent study by the McKinsey Group. China, currently a majority rural population, wants to reverse its demographic distribution of urban-to-rural residents within the next twenty years. To accomplish that, deploying current strategies of development, China will need to demolish hundreds more New Hampshires—worth of farmland.

In countries where the ratio of farmland to human population is more favorable, most of the farms are less than thirty acres in size. For example, I visited a set of officially designated “farms” two years ago in Vietnam, most of which were backyard spaces roughly a quarter acre in size. That Deere 70 Series High Octane Harvesting Combine will never be of use on a thirty-acre corn field, much less a one-acre backyard farm.

### **If This Is a Decades-old Problem, Why Is the Crisis Suddenly Upon Us?**

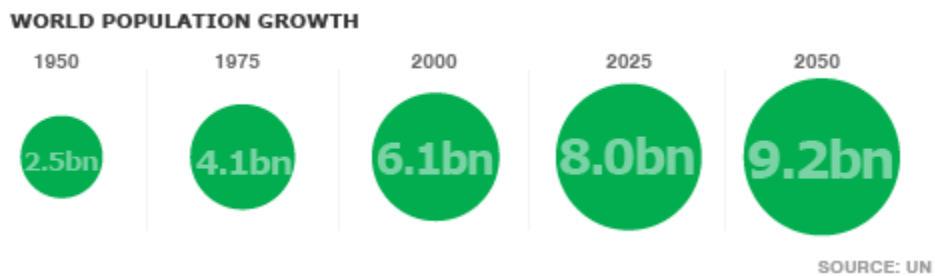
A university professor visited me from London last month, and we fell to discussing food costs. He complained that his family of four was devouring just as much food as a year ago, but at a cost that had jumped by about one hundred British pounds (roughly \$200) a week. A friend in California tells me she has taken to putting all food scraps in a blender at the end of the day, feeding that slop to her dogs in lieu of the now unaffordable dry pet chow. Last month in Singapore—a very rich country—university students told me they can no longer eat out at restaurants—just noodle shops and pizza parlors.

Over the last eighteen months the cost of every food item has increased in the United States. Imported foods—especially those from Europe—are more expensive thanks to the plummeting value of the dollar. But domestically produced foods, from

apples to bread, are also significantly more costly today. Driving these soaring costs (see graphic on page 9) are the rising prices of the fundamentals: wheat, corn, rice, soy, and cooking oils.

What makes this food crisis different from all others is that everybody can feel it, no matter where they live, no matter what they earn. And it is different because it is not transient, but a new permanent feature in the global landscape. Though it is, of course, the poorest who suffer the most, with vast swathes of the world population now trying to get by without protein in their diets, this round of food inflation is a pain felt ‘round the world.’ Its roots are deep and structural, and in the absence of serious, global changes in the architecture of food production and distribution, the crisis will only worsen with time, becoming a permanent feature. The World Food Program has called it “a silent tsunami,” reflecting on the scale of this change. To use a disease metaphor, we are currently in a food pricing *epidemic*, which threatens to become *endemic* everywhere in the world.

The greatest challenge to policymakers rests with the complexity of causality: No one piece of legislation or government action can begin to tackle the crisis, even in the short term, much less for decades to come. Policy must be based on a complex view, embracing *all* the factors at play.



### POPULATION INCREASE

Though the rate of human population growth has slowed considerably compared to the dire forecasts made in the mid-twentieth century, we remain a rapidly multiplying species on a planet of limited size and resources. Without dramatic investment in family planning, coupled with positive incentives for smaller families, food demand will increase as surely as  $1+1=2$ .

## FARMLAND DECREASE

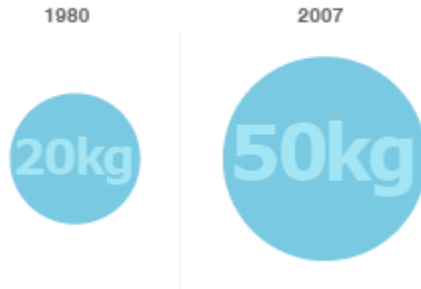
The world population is simultaneously urbanizing, now approaching being equally distributed in rural versus urban settings. The United States is losing roughly fifty acres of farmland daily, primarily due to urban and suburban sprawl. Rising urbanization is not, however, as great a threat in the United States and other parts of the world where vast fertile farmlands remain amid urbanization, and can be productively worked by small numbers of human beings armed with high-tech tractors and irrigation capacities. But where agricultural production is labor-intensive, largely unmechanized work, the loss of rural labor forces to urban centers results in lowered productivity from remaining agricultural lands.

## POSITIVE DEMOGRAPHICS BRING NEW CHALLENGES

The World Bank predicts nearly a billion more people will join Earth's middle class by 2030. This reflects a wonderful trend that has been underway, particularly in Asia and Latin America, since the 1980s as prosperity rises. But with middle class prosperity comes demand for meat and diverse foods. Not only has the purchasing power of hundreds of millions of people improved dramatically, but their appetites have broadened beyond the basic foodstuffs that previously formed the diets of their populations. In 1983 the rich world consumed about 88 million metric tons of meat, and the poor world consumed 50 million metric tons. By 1997 rich world consumption had risen to 99 million metric tons, but poor world consumption more than doubled, to 112. FAO projects that by 2020 the rich world will be consuming only modestly more meat, while developing and middle income countries will devour 217 million metric tons of poultry, beef, dairy, and pork.

### CHANGING EATING HABITS

Meat consumption in China per capita:



### PRESSURE ON RESOURCES

1,000-2,000 litres of water is needed to produce 1kg of wheat



10,000-13,000 litres of water is needed to produce 1kg of beef



SOURCE: FAO

One reason the H5N1 bird flu is proving so difficult to control, for example, is that poultry production across Asia has soared dramatically over the last five years, and will continue to rise over the coming decade. By 2020 the lower-income nations of the world will be eating more than three times as much chicken and duck as they did in 1997. In Latin America consumption of all meats has also risen. And as prosperity hopefully comes to sub-Saharan Africa, demand for meat and a wider diversity of vegetables, oils, sugar, flour, and prepared foods will increase there, as well.

Because of their population sizes, the increase in percentages of Chinese and Indians joining the middle class has the greatest impact on food demand. President George W. Bush took note of this in a recent speech on the food crisis, saying, “Just as an interesting thought for you, there are 350 million people in India who are classified as middle class. That is bigger than America. Their middle class is larger than our entire population. And when you start getting wealth, you start demanding better nutrition and better food. And so demand is high, and that causes the price to go up.”

CHEW ON THIS		
	INDIA	US
Food consumption	2400-2600 Calories/ person/day	3400-3800 Calories/ person/day
Total population	1.19 billion	301 million

The president's remarks were sharply attacked in the Indian media, where graphic presentations of U.S. versus Indian food consumption were widely displayed. On average, it was noted, Americans consume one thousand

more calories daily compared to Indians. The Indian media denounced the administration, sensing—inappropriately—that the White House was condemning the nation’s rising affluence.

The president’s point was, however, valid: the World Bank predicts that eight hundred million people worldwide, chiefly in India and China, will join the middle class over the next few years. In 1990 average per capita income in China was \$1,310 per year; by 2005, it was \$5,300 per year. Per capita income in India jumped over the same time period from \$1,380 per year to \$2,700.

Decades ago American politicians promised our grandparents, “A chicken in every pot.”

Today it is the politicians of India, China, Brazil, and Mexico making that promise to their people—and we should rejoice at their rising prosperity. But we have to recognize what this means for consumer demand, not just today, but for decades to come: It’s not just American politicians telling one hundred million people there will be a chicken in every one of the cooking pots—its politicians the world over making that vow to three *billion* people.

## RISING OIL PRICES

With oil now topping \$120 a barrel a myriad of agricultural and food distribution costs are soaring. Fertilizers, pesticides, food packaging materials, fuel for farm equipment, and transport of livestock and crops—every one of these factors is highly sensitive to oil prices. In the United States, for example, overall cost for farmers increased by 17 percent over the last twelve months (April 2007 to April 2008), with fertilizer jumping 65 percent, feed leaping by 27 percent, and the average price for tractor diesel rising 43 percent. When coupled with the costs of transporting food, livestock, and agricultural supplies, these petroleum-based sources of inflation are having an impact on every aspect of growing and distributing food.

## BIOFUELS





With petroleum costs soaring, and climate change anxieties rising, there is enormous interest in converting some fuel used to biologically derived ethanol. Whether used to

power a compact sedan or an eighteen-wheeler diesel truck, ethanols are attractive options. Nearly all commercial biofuel production, however, burns food crops: corn, sugar cane, soy oils, palm oil. Diverting cropland into gas-tank land adds to the upward pressure on food prices. Between 2006 and 2007 the price of corn increased 55 percent, not least because corn was being converted into ethanol. Yet there is very little support for the notion that corn constitutes a smart fuel source. Based on December 2006 oil prices, the costs of transporting, processing, and blending corn and turning it into an ethanol/gasoline automobile blend added \$4.40 to the price of each gallon of fuel—added costs not visible to consumers due to government subsidies and tax incentives.

Those are cost estimates the USDA most certainly would dispute. In a 2000 USDA study it was cheerfully estimated that the costs of corn ethanol production would continuously plummet, thanks to improved efficiency and science. The USDA reckoned that production costs for corn ethanol were about \$2.47 a gallon in 1978, but had fallen to \$0.90/gallon by 2000—and would continue to fall throughout this decade. These estimates, however, assumed that the price of corn would stay at roughly 1999 levels, and that transport fuel costs were a trivial component in the equation. Instead, corn costs have soared in the United States from a 1999 high of \$1.94/bushel to a 2008 level around \$5.74/bushel. Gasoline costs have soared from roughly \$1.30/gallon in 2000 to more than \$3.60/gallon today. (One bushel of corn yields about 2.7 gallons of ethanol.)

Joseph Glauber, chief economist for the USDA, recently told Congress that corn prices will stay at “historically high levels” for years to come, due to the expanding demands of the U.S. ethanol industry. On April 24, 2008, the British medical journal the *Lancet* opined, “In the drive to make the USA self-sustaining for fuel production, massive ethanol subsidies and millions of acres of American corn have led to a boom in biofuels. American cars now burn enough corn to cover the import needs of eighty-two food-deficit countries. But thanks to a backlash against biofuels in Europe, the European Union, once committed to a 10 percent biofuel target by 2020, is sensibly rethinking its position.”



				
	<b>Gasoline</b>	<b>Biodiesel</b>	<b>Corn-derived Ethanol</b>	<b>Cellulosic Ethanol</b>
	<b>Bad</b>	<b>Good</b>	<b>Transitional</b>	<b>Potentially Great</b>
	A non-renewable fossil fuel produced by refining crude oil; emits large quantities of CO <sub>2</sub> upon combustion.	A renewable alternative to petroleum diesel produced from animal fat or vegetable oil.	The main source of ethanol in the U.S. But growing corn is energy-intensive and requires large amounts of fertilizer made with fossil fuel.	Production results in the same ethanol that corn produces, but the feedstocks, especially switchgrass, are inexpensive and easy to grow and the process of refining them is environmentally friendly.
Net Energy Balance *	N/A	3.20	1.34	2.62
Reduction in Greenhouse Gas Emissions	None (1 gallon produces 19 lbs of CO <sub>2</sub> )	67.7%	21.8%	91%
Cost (per gallon)	\$3.10	\$2.90 average	\$2.55 (E85)	\$2.55 (E85)
Gallons/Acre	n/a	Varies by feedstock Rapeseed: 127	328	Varies by feedstock Switchgrass: 1000
Current U.S. Production (gallons/year)	79 billion	75 million	4.9 billion	(no current production at commercial scale)
Availability	114,974 stations	1,485 Stations	1,133 E-85	1,133 (E85)

Source: Center for American Progress, 2008.

Sugarcane is a far more efficient source of ethanol—it is already a sugar (while corn is a starch, requiring additional fossil fuel burning to convert it to a sugar), and it has a lower carbon footprint. One gallon of corn/ethanol emits 16.2 pounds of carbon dioxide; the same amount of sugarcane-derived ethanol emits nine pounds of CO<sub>2</sub>, according to the Singapore think tank, Rajaratnam School of International Studies. Brazil currently dominates the world sugarcane/ethanol market, producing twenty-two billion liters of cane/ethanol in 2007.

On April 25, 2008, the Lehman Brothers firm completed an analysis of biodiesel fuels in Europe and North America, concluding that “poor economics and tepid government support are minimizing its near-term contribution to oil markets while fuelling food prices.” Today about 44 percent of all biodiesel fuel is derived from

rapeseed oil: in 2000 a negligible amount of global rapeseed oil was burned for fuel, while this year 28 percent of rapeseed oil ends up an energy source. Biofuels now devour 8.4 percent of total global soybean oil production and 2.9 percent of palm oils. According to the Lehman analysis, “2008 biodiesel prices have averaged \$0.75/gal higher in the U.S. and \$1.75/gal higher in Europe than diesel counterparts,” making the plant-derived products poor substitutes for petroleum fuels.

Environmentalists oppose the use of corn as a fuel source, arguing that so much fossil fuel must be used in the transport and production of the ethanol that the net carbon footprint of a gallon of ethanol shows no real advantage over direct fossil fuel consumption. The University of Minnesota’s David Tilman has long promoted use of native prairie grasses as primary biofuels for North America. By his calculus, native grasses require almost no fertilizers or pesticides, produce 238 percent more potential energy per acre than corn, devour carbon dioxide, and act as “carbon-sinks,” helping to obviate climate change. Tilman calculates that prairie grasses could “replace about 13 percent of global petroleum consumption for transportation and 19 percent of global electricity consumption. This could eliminate 15 percent of current global carbon dioxide emissions.”

## CLIMATE

The science on focused climate impact on crop production is insufficiently refined to allow credible correlations between a given region’s yield and global changes in carbon emissions. Nevertheless, there have been disturbing trends in climate that threaten agricultural production. Australian farmers have almost completely abandoned rice production, switching permanently to wine grape growing, after six consecutive years of severe drought. Glacial melting rates in the Himalayas have hastened considerably, with recent multinational studies demonstrating that soot pollution at high altitudes may be attracting sufficient solar heat to destroy ancient glaciers within the next thirty years. This mass melt would imperil the survival of the Ganges, eliminating rice production throughout much of south Asia. Rice is the most water-sensitive crop, so any permutations in global rainfall or ice melt can have profound effects on crop production.

There are signs that the environments of multiple species of pollinating insects, bats, and birds have been so disturbed—probably by a combination of climate and human encroachment factors—that natural plant reproduction is imperiled. Climate analysis requires far more complex thinking and refined tools before specific predictive analysis can be made on a crop-by-crop basis. As a general statement, however, severe weather events caused by shifting climates, coupled with water scarcities and declines in pollinator populations have probably already had an impact on food production, and most certainly will have increasingly significant impacts in coming years.

### DISEASE

Agricultural diseases caused by microbes, fungi, or insects appear to be increasingly plaguing production. As is the case with human and livestock diseases, there is evidence both for a surge in newly emerging and previously unknown microbial diseases, and for greater international spread of microbes due to globalized human and crop transport. Massive mono-culturing of crops imposes a sort of Darwinian selection pressure on insect populations, promoting emergence of aggressive, crop-specific breeds. Application of pesticides in such settings tends to promote emergence of chemically resistant insect populations. All of these factors can impose heavy price pressures on crop production.

### YET TO BE DETERMINED

There is some evidence that food price escalation jumped recently due to changes in investment strategies by leading hedge funds and institutional investors. Due to the peril in stock and real estate investment spawned by the American mortgage crisis, some funds shifted to commodities trading in search of financial safe havens. How significantly these investment changes may have affected food prices remains to be determined, however.

### **Policy Directives That Make Sense**

In Mexico the price of a tortilla jumped 14 percent between Januaries 2006 and 2007. The average Mexican consumes 120 kg of tortillas a year, making the corn product the top staple of their diet. Thousands of Mexicans took to the streets, protesting the cost rise.

The central government responded by investing in agricultural production, boosting domestic corn harvests by 6 percent. As a result, tortillas are only marginally more expensive this year, compared to 2007.



The Mexican story illustrates that food prices *can* be stabilized by sound policies. Whether the Mexican strategy will hold down the costs of tortillas throughout 2008, and into the future, remains to be seen, but the principle of government investment in domestic food production is a sound one.

Also sound was President George W. Bush's call for a reduction in the amount of "food aid" delivered by the United States in the form of surplus American crops. Dropping from giving nearly 100 percent of our aid in the form of food to 75 percent would be a nice start, though American aid would still continue to distort local agricultural markets.

Western Europe and Canada have already made more radical shifts toward cash donation, and this year for the first time in its history the World Food Program may hit the 50-50 mark, reducing to half the amount of rich-world crop surplus it is compelled to dump on the poorer nations.

*Still, the goal for America should be far more drastic, cutting our crop component of aid down to 50 percent for FY 2009, with further reductions scaling in over the following five years.* Senegal's President Wade is correct about the demeaning role of "charity" versus the empowering possibilities of direct investment in the tools of efficient agriculture: reapers, sowing machines, tractors, irrigation systems, fertilizers, high quality seed stock, and the like.

Congress must stop pitting the financial interests of large agricultural companies against the food security of hundreds of millions of people over the coming decade. Protecting crop production in Iowa or California through such distorting mechanisms of mandatory crop "aid" dumping is little more than a cynical grab for domestic votes—*by both parties.*

Government support of the biofuels research and development should continue, but with focus shifting swiftly away from food crops toward cellulose, like prairie grasses, wood chips, and garbage. Joachim von Braun of the International Food Policy Research Institute says that *all* subsidies on biofuel production in wealthy nations must be lifted. I would amend that slightly: drop biofuel subsidies on food crops, such as corn. But the USDA and National Science Foundation in the United States should step up R&D on non-food sources of biofuels, particularly cellulose.

*Protectionist policies that stifle the agricultural free market should be eliminated.* The EU, Canada, the United States, Australia, and other wealthy nations must allow middle- and low-income nations access to their marketplaces, without punishing tariffs and other impedances. Drivers in New Jersey have a right to choose Brazilian sugarcane-derived ethanol for their cars. The world rice market should see Asian, American, and all other producers competing on an equal footing for consumer sales. Tomatoes grown in Guatemala or Kenya should have as good a chance of being consumed by schoolchildren in Oslo as those harvested from the soils of Italy or Spain.

Protectionist policies and agricultural trade barriers no longer make any sense as the demand for food is skyrocketing and the numbers of middle class consumers are soaring. *The global marketplace is plenty big enough to support purchase—at good prices—of crops from all of the worlds’ farmers, whether they are growing wheat in Montana or corn in Malawi.*

Congress should immediately lift all shipping requirements that compel the use of U.S. transport companies to get food to needy recipients. The GAO found that the largest food aid organizations spend “approximately 65 percent of (their food aid funds) for transportation to the U.S. port for export, ocean transportation, in-country delivery, associated cargo handling costs, and administration.” *Congress must stop trying to fool American taxpayers into believing that they ought to subsidize the U.S. transport industry at the expense of starving overseas masses.*

The GAO found that “Transportation and business costs have contributed to a 52 percent decline in average tonnage,” of crops sent overseas for food aid. Meanwhile, transport has devoured aid budgets, “with average freight rates rising from \$123 per metric ton in fiscal year 2002 to \$171 per metric ton in fiscal year 2006. At current U.S.

food aid budget levels, every \$10 per metric ton reduction in freight rates could feed almost 850,000 more people during an average hungry season.”

*This shameful misuse of aid dollars must come to an immediate end.*

NGOs and humanitarian relief groups must reduce the overhead on their food assistance by following the brave example set by the organization CARE last year. Last summer CARE stunned the NGO world by turning down \$45 million worth of U.S. “food aid,” refusing to accept more heavily subsidized American crops. CARE’s bold decision was roundly criticized by other leading aid groups, such as World Vision, Save the Children, and Catholic Relief Services. *Today the humanitarian NGOs should take a hard look at CARE’s achievements, and tell Congress and its European counterparts that it is time to stop dumping crops, rather than cash.* But the NGO sector has to prove itself capable of properly using cash to build up farming in poor countries—a challenge for groups that have for decades been fixated on handing out sacks of grains to poor people, queued and begging. Many NGOs have built their entire overseas development programs atop schemes that involve receiving free food from the United States, selling the food in poor countries and using the cash to fund local programs.

The 2007 GAO described these food aid schemes as highly inefficient, noting:

Multiple challenges reduce the efficiency of U.S. food aid programs, including logistical constraints that impede food aid delivery and reduce the amount and quality of food provided as well as inefficiencies inherent in the current practice of using food aid to generate cash resources to fund development projects. While in some cases agencies have tried to expedite food aid delivery, most food aid program expenditures are for logistics, and the delivery of food from vendor to village is generally too time-consuming to be responsive in emergencies. Factors that increase logistical costs and time frames include uncertain funding and inadequate planning, ocean transportation contracting practices that disproportionately increase risks for ocean carriers (who then factor those risks into freight rates), legal requirements, and inadequate coordination to systematically track and respond to food delivery problems, such as food spoilage or contamination. While U.S. agencies are pursuing initiatives to improve food aid logistics—such as prepositioning food commodities—their long-term cost-effectiveness has not yet been measured. In addition, the current practice of selling commodities as a means to generate resources for development projects—monetization—is an inherently inefficient use of food aid. Monetization entails not only the costs of procuring, shipping, and handling food, but also the costs of marketing and selling it in recipient countries. Furthermore, the time and expertise needed to market and sell food abroad requires NGOs to divert resources away from their core missions.

All of these costs and distortions in humanitarian and development programs could be lessened through cash, versus food, donations.

At the international level, it is heartening that UN secretary-general Ban Ki-moon has appointed a high-level commission to oversee emergency food operations throughout the UN system. Similarly, recently announced schemes on the part of the World Bank and Asian Development Bank involving direct investment in farming technology for poor countries are salutary moves. But we must go further. *The institutions within the UN system that deal with food issues—from FAO to UNICEF to the World Food Program—must change their ways of doing business, recognizing that the food crisis signals profound structural change in global agriculture and related economics.*

Together—donors, growers, financiers, political leaders, humanitarian groups and the UN system—we must collectively shake off what Senegal’s Wade denigrates as a “charity” model of food aid. The entire global system aimed at feeding the world’s poor must urgently shift gears, becoming an infrastructure that enhances food production worldwide, fights trade barriers, and firmly links human development with capital investment in livestock and crop production.

I would not imagine for a moment that this food crisis is a temporary phenomenon, or that it can be solved with a single round of food or monetary donations. The entire structure of food production, consumer demand, and global distribution has changed—and possibly for the long term. It will take bold, carefully analyzed adaptive steps, both here and abroad, to ensure that these structural changes don’t lead to the slow starvation of hundreds of millions of people—not just in 2008, but for years to come.

### **About the Author**

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