

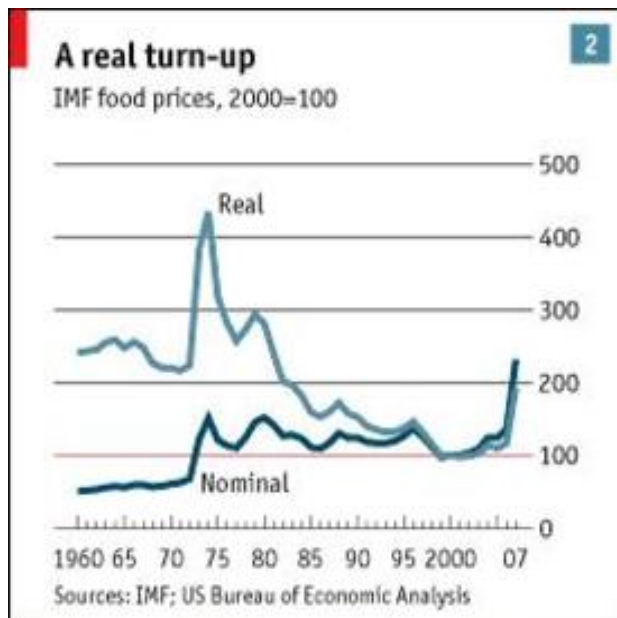
Mother Earth's Triple Whammy. North Korea as a Global Crisis Canary

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Gas prices are above \$4 a gallon; global food prices surged 39% last year; and an environmental disaster looms as carbon emissions continue to spiral upward. The global economy appears on the verge of a TKO, a triple whammy from energy, agriculture, and climate-change trends. Right now you may be grumbling about the extra bucks you're shelling out at the pump and the grocery store; but, unless policymakers begin to address all three of these trends as one major crisis, it could get a whole lot worse.



After steadily declining over the past 30-years, global food prices have just about doubled since 2005!

Just ask the North Koreans.

In the 1990s, North Korea was the world's canary. The famine that killed as much as 10% of the North Korean population in those years was, it turns out, a harbinger of the crisis that now grips the globe -- though few saw it that way at the time.

That small Northeast Asian land, one of the last putatively communist countries on the planet, faced the same three converging factors as we do now -- escalating energy prices, a reduction in food supplies, and impending environmental catastrophe. At the time, of course, all the knowing analysts and pundits dismissed what was happening in that country as the inevitable breakdown of an archaic economic system presided over by a crackpot dictator.

They were wrong. The collapse of North Korean agriculture in the 1990s was not the result of backwardness. In fact, North Korea boasted one of the most mechanized agricultures in Asia. Despite claims of self-sufficiency, the North Koreans were actually heavily dependent on cheap fuel imports. (Does that already ring a bell?) In their case, the heavily subsidized energy came from Russia and China, and it helped keep North Korea's battalion of tractors operating. It also meant that North Korea was able to go through fertilizer, a petroleum product, at one of the world's highest rates. When the Soviets and Chinese stopped subsidizing those energy imports in the late 1980s and international energy rates became the norm for them, too, the North Koreans had a rude awakening.

Like the globe as a whole, North Korea does not have a great deal of arable land -- it can grow food on only about 14% of its territory. (The comparable [global figure](#) for arable land is about 13%.) With heavy applications of fertilizer and pesticides, North Koreans coaxed a lot of food out of a little land. By the 1980s, however, the soil was exhausted, and agricultural production was declining. So spiking energy prices hit an economy already in crisis. Desperate to grow more food, the North Korean government instructed farmers to cut down trees, stripping hillsides to bring more land into cultivation.

Big mistake. When heavy rains hit in 1995, this dragooning of marginal lands into agricultural production only amplified the national disaster. The resulting flooding [damaged](#) more than 40% of the country's rice paddy fields. Torrential rains washed away topsoil, while rocks and sand, dislodged from hillsides, [ruined](#) low-lying fields. The rigid economic structures in North Korea were unable to cope with the triple assault of bad weather, soaring energy, and declining food production. Nor did dictator Kim Jong Il's political decisions make things any better.



Fighting floods in North Korea in 2007

But the peculiarities of North Korea's political economy did not cause the devastating famine that followed. Highly centralized planning and pretensions to self-reliance only made the

country prematurely vulnerable to trends now affecting the rest of the planet.

As with the North Koreans, our dependency on relatively cheap energy to run our industrialized agriculture and our smokestack industries is now mixing lethally with food shortages and the beginnings of climate overload, pushing us all toward the precipice. In the short term, we face a food crisis and an energy crisis. Over the longer term, this is certain to expand into a much larger climate crisis. No magic wand, whether biofuels, genetically modified organisms (GMO), or [geoengineering](#), can make the ogres disappear.

After the attacks of September 11, 2001, "We are all Americans" briefly became a popular expression of solidarity around the world. If we don't devise policy choices that address energy, agriculture, and climate, while replacing the idolatry of unrestrained growth at the heart of both capitalist and communist economies, the tagline for the 21st century may be: "We are all North Koreans."

Through a Glass Darkly

For years, development experts have bemoaned the declining terms of trade that have kept some developing countries, and most poor farmers, mired in poverty. With the exception of the first energy crisis era in the 1970s, between the end of World War II and 2006, food prices never stopped sinking in relation to manufactured goods. Lower food prices are generally a boon for consumers. But they are devastating for the subsistence farmers who make up the [vast majority](#) of the world's poor.

However, over the past three years, according to the World Bank, food prices have increased 83%. That may be only an annoyance for wealthy shoppers, but for the poor, who often devote more than 50% of their incomes to feeding their families, such staggering rises can be the difference between life and death.

There are a number of reasons for this recent spike. The price of oil, now near \$140 a barrel, has certainly played a crucial role in this, both by driving inflation generally and because of its importance to modern, large-scale agriculture. So has the recent allocation of ever more agricultural land to biofuel production. U.S. farmers, responsible for 70% of all world corn exports, now dispatch one-fifth of their corn to ethanol production, which has had the effect of nearly doubling the price of corn.

Global warming, too, has had an impact. Drought in Australia and the eastern United States, severe flooding in China and Bangladesh, rising ocean levels and fresh water shortages throughout the world are all thought to be related to climate change, though climate scientists cannot prove that any given weather anomaly is caused by global warming.

Climate scientists can be fuzzy this way about causality in the short term. Paradoxically, however, they often see the future more clearly. For instance, the top global food policy think-tank, International Food Policy Research Institute (IFPRI), [predicts](#) that global warming will be responsible for a 16% decrease in agricultural gross domestic product globally by 2020. The Center for Global Development argues that [developing countries](#), in particular, will be hit hard by climate change: By 2080, India, its report argues, will see a staggering 30-40% drop in agricultural production and Senegal will plummet 50%.

In the United States, a much-anticipated, Bush-administration-delayed [federal study](#) foresees water shortages, more herbicide-resistant weeds, and more insect infestations as a result of climbing temperatures. The present food crisis, concludes Joachim von Braun of the IFPRI, "foreshadows what climate change will bring us."

The other major driver of food price increases is certainly rising income levels in key

developing countries. With more income, people can, of course, eat more, and eat higher off the hog -- or, put another way, they can eat hog in the first place, rather than the lentils or cassava on which they were subsisting.

Over a decade ago, Lester Brown, the founder of World Watch, suggested that just such a crisis was on the way. He [asked](#) whether the world could possibly produce enough grain to feed a more prosperous China. Now, growing middle classes in China and India, the world's most populous countries, are, just as he predicted, changing their eating habits and consuming more meat (and so, indirectly, a great deal more grain, which is used to feed the animals they are now cooking).

Lester Brown was ahead of the curve, but there were ample warning signs of an impending food crisis for those ready to see them. Oil prices have been steadily increasing since 2004 as a result of rising demand. They have been helped along greatly by growing chaos in the Middle East, fed by the Bush administration's foolhardy invasion of Iraq.

Like the North Koreans, we, too, have been trying to squeeze more food out of a limited amount of land: arable land per capita is [declining](#) at a steady rate. Falling water tables and dry rivers -- think climate change again -- have no less surely pointed to a coming crunch for farmers dependent on irrigation. And don't forget: Critics of biofuels warned [time](#) and [again](#) that there wasn't enough elasticity in the food supply to take food out of the mouths of people in the Global South in order to fill the gas tanks of the Global North.

Back in the early 1990s, the North Korean leadership failed to grasp the correlation between rising oil prices, declining food stocks, and environmental stresses -- and the political pundits and politicians of the planet conveniently wrote off the resulting catastrophe as uniquely the fault of the world's

weirdest country. Instead of taking a timely hint, wealthier governments simply shrugged off the warnings of scientists, development professionals, and energy specialists about future crises.

Responding to Riots

There's nothing like a food riot, however, to get wealthy governments to sit up and take notice. Humanitarian organizations and aid officials may be concerned about people quietly starving to death in remote locations, but only when world security suddenly seems threatened and governments totter do rising food prices translate into a full-blown crisis. Washington, for example, **woke up** when riots broke out in Egypt, Haiti, and Indonesia, and the militaries in Pakistan and Thailand **intervened** to protect crops and storage facilities.

In response to the sudden crisis splatting on the global windshield, the United Nations food aid agency, the World Food Program, called for \$755 million in emergency contributions. Saudi Arabia, its coffers flooded with oil profits, promptly promised \$500 million. The World Bank then announced that it was increasing its overall support of global agriculture by \$2 billion in 2009, while Washington **offered** \$5 billion in food aid over the next two years.

Such an emergency response may, indeed, be necessary, but it is also distinctly inadequate. The Director-General of the U.N.'s Food and Agricultural Organization, Jacques Diouf, has called for a minimum of **\$30 billion a year** for a global agricultural restructuring. It's not at all clear who will pony up such sums, which, in any case, will be too late for countries like Haiti whose subsistence farmers needed help before their most recent growing seasons started. Most importantly, though, as an approach, it's too conventional and, in the long run, bound to fail.

After all, the wealthiest countries continue to show little or no interest in altering the policies that have contributed so decisively to the food crisis in the first place. Take the United States. It "ties" -- places restrictions on -- about **70%** of its aid. That means recipient countries must use that aid to buy U.S. products, which, of course, will do little to strengthen local economies. Washington has also **cut** its international agricultural research by as much as 75% at a time when agricultural production is no longer keeping pace with population increases. Add in the \$280 billion farm bill that Congress has just passed which, unbelievably enough, provides continued subsidies to "farmers" (read: agribusiness) already benefiting enormously from high food prices. And the European Union, like the United States, is **refusing to backtrack** on its commitment to boost biofuels produced from grain.



Biodiesel barrels

Nor is there much hope for a new Green Revolution. While the campaign to disseminate modern, industrial agricultural techniques that began in the 1960s did increase food production, rural poverty in the developing world remained endemic (which is why the

current food crisis is so devastating to subsistence farmers). Today, a repetition of that Revolution's combo of hybrid seeds, intensive irrigation, and the heavy application of petroleum-based fertilizers holds little promise.

Water is scarcer. Oil (and thus fertilizer) is considerably **more expensive**. The promised next stage of the Green Revolution, the application of biotech advances through genetically modified organisms to produce new, high-yield, insect-resistant crops, generally hasn't lived up to its hype in the developing world.

Yet Western seed companies are **taking advantage** of the crisis to tout this particular high-tech solution. Oddly enough, all this is depressingly reminiscent of the North Korean leadership's fascination with quick fixes in the 1990s. North Korean leader Kim Jong-Il, for instance, touted potatoes as a miracle crop, but the True Potato Seed project sponsored by the U.S. government never panned out. Giant rabbits produced by a German breeder as a newfangled North Korean livestock were a **dead-end**, probably because the animals themselves consumed as much food as they ultimately yielded. A variety of high-yield "supercorn" hasn't yet revolutionized North Korean agriculture. Neither in North Korea nor in the world at large has anyone yet figured out a technical shortcut to permanent cornucopia.

Markets to the Rescue?

Perhaps the most conventional approach to the crisis has been to rely on market mechanisms. Consider the International Food Policy Research Institute, a product of the Green Revolution and its leading booster, and its **eight-point plan** for solving the crisis. Several of the steps are eminently sensible, such as expanding humanitarian assistance to food-challenged countries, reversing biofuel policies, and investing in social programs such as school

feeding programs and health care. In the mix, however, are more of the same old market mantras. IFPRI recommends, for instance, the elimination of the export bans which 40 countries, including India and Indonesia, recently implemented to keep food from flowing out of the country through trade. And it has tried to revive a dead horse by urging further World Trade Organization (WTO) negotiations to reduce barriers to global trade in agricultural products.

Pundits and policymakers addressing food problems have called for the elimination of government regulations and tariffs ever since England repealed its Corn Laws in the 1840s. In the last quarter century, the removal of trade restrictions of every sort facilitated greater agricultural production globally. Free trade helped large producers grow more and sell it cheaper abroad. But free trade **hasn't helped** the rural poor -- or poor countries.

Quite the opposite. The increased concentration of corporate farming and the dismantling of state programs that sustained the agricultural sector have **driven small farmers** out of business all over the planet, while making many of those who remain ever more dependent on expensive chemical pesticides, fertilizer, and seeds. For instance, as a result of the North American Free Trade Agreement, Mexico **lost** 1.3 million agricultural jobs, forcing many desperate small farmers to cross into the United States as migrant workers. Even more strikingly, the continent of Africa **went** from a net exporter of food in the late 1960s to a net importer today -- thanks to the World Bank and the WTO riding roughshod through the continent in the same cavalry unit as the four horsemen of the apocalypse. The Bank's "structural adjustment programs" and the WTO's "tariff reductions" don't quite have the ring of war, pestilence, famine, and death, but they have been just as devastating.

The quest for perfect markets usually conceals

a global shell game in which wealth is redistributed from the many to the few. To even the playing field that markets constantly tilt in favor of the powerful, and to direct funds toward environmental sustainability, governments need to intervene in the economy.

After all, private enterprise is not going to invest in the large-scale improvement of rural infrastructure -- the capital costs are high and profit margins far too low. More controversially, developing countries may need to maintain, or even reestablish, tariffs and subsidies to protect local producers. Since it is both sold and consumed, food should be considered a strategic resource, a matter of national security. It should be left out of trade negotiations in the same way that the "[national security exception](#)" allows governments to subsidize and protect their military industries as they please.

On Being Canaries

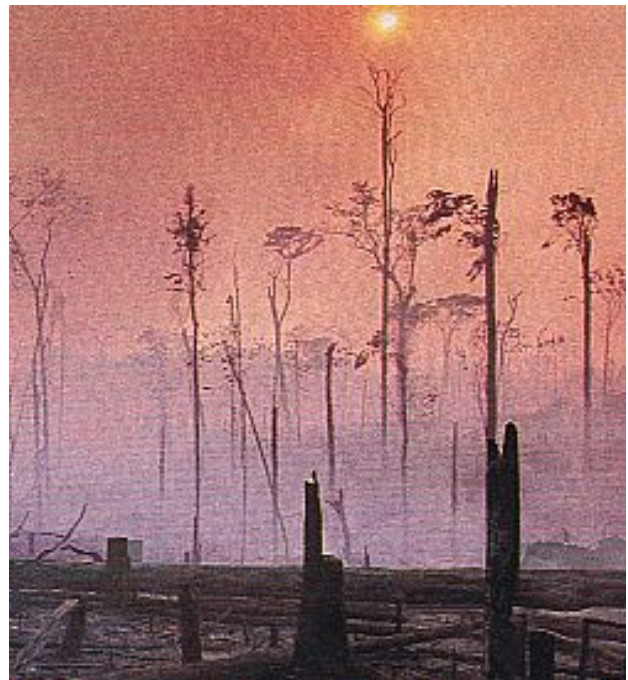
Any response that doesn't address all three converging trends -- rising energy costs, stagnant per-capita agricultural production, and climate change -- will ultimately fail, just as it did in North Korea in the early 1990s.

Land, energy, and the biosphere are limited resources. And it's not only a peak in oil that we may be approaching. The [depletion](#) of oil resources and the urgent need to reduce carbon emissions from their [current levels](#) have at least entered mainstream discussion. Less well known, however, are the problems of peak land and peak water.

The last time food prices shot up, in the 1970s, the U.S. response was to put more land into agricultural production. This was the infamous "fencerow-to-fencerow" policy of Secretary of Agriculture Earl Butz that Michael Pollin, author of *The Omnivore's Dilemma*, has linked to the glut of corn -- and corn syrup -- that has so profoundly affected global diets. But re-

Butzing American agriculture is no longer an option. "For the first time in our history, we're pushing up against the edge in terms of quality land," [says Otto Doering](#), a professor of agricultural economics at Purdue University. "We're in a somewhat fixed box."

The same applies to the world at large. Although rainforests are still being transformed into farming plots and pasture -- only increasing carbon emissions into the atmosphere -- humanity is reaching the limits of arable land. Chalk it up to urbanization, climate change-caused drought, and a loss of soil fertility through the application of too much fertilizer. Whether forest or farmland, we are losing productive land at a [rate](#) of one hectare every 7.67 seconds. Sure, there's some wiggle room in Africa and Latin America, but bringing this additional land into cultivation will buy us only a little time -- at the expense of the overall environment.



Destruction of rainforests

The water situation is even more precarious. The world is facing a declining reserve of fresh water with the depletion of underground

reserves in India, China, Africa, and even the United States. (Say goodbye to the Midwest's mighty Ogallala aquifer, which nourishes America's breadbasket). Aside from the 1.1 billion people who already lack safe drinking water, according to the U.N., this crisis threatens farming, which monopolizes 70% of all fresh water.

Global temperature increases will only aggravate the situation. Rising oceans will inflict death-by-salt on increasing amounts of low-lying farmland, while drought dries up once fertile farming regions. Any intensification of the Green Revolution, dependent as it is on chemical fertilizer and irrigation, is only likely to add to the problem. And **don't count** on the oceans to offset the food that will no longer be grown on land. The catch of wild fish has remained pretty much the same since the mid-1980s, and fish farming, too, requires land, water, and energy.

In the long run, the only realistic response is a comprehensive program to address, in tandem, the triple crises of energy, climate, and land and water resource exhaustion. If policymakers take into consideration only one, or even two, of the components of this trinity, they may well end up doing more harm than good. The making of biofuels from corn, for instance, was an attempt to address the problems of the cost of energy and the dangers of climate change, but it neglected to consider the effect on agricultural production -- hence, the disastrously soaring price of corn. Calls for the next phase of a Green Revolution, which address agricultural production, are guaranteed to play havoc with the energy and water crises.

Such partial approaches don't work largely because they assume unlimited resources. The original sin of unrestrained growth can be found in the economic theologies of both communism and capitalism. In these systems, neither the state nor the market has ever

operated according to ecological principles. Now, we must quickly explore ways of boosting agricultural production in fundamentally sustainable ways without, somehow, expanding our carbon footprint.

Certainly organic farming will play a role here. Although Green Revolution guru Norman Borlaug has **dismissed** organic agriculture as incapable of feeding the world, an important new study published by Cambridge University Press shows that organic systems in developing countries can produce **80%** more than conventional farms.

Integrated farming systems that rely on sustainable energy -- solar, wind, tidal -- will also be critical. No-till agriculture can cut down on energy use and soil erosion.

While properly wary of snake-oil salesmen, neither can we afford to be Luddites. New technologies will play a role as well, as long as they reduce fertilizer and pesticide use, don't shackle debt-ridden farmers to major seed companies, and meet strict consumer safety requirements.

Even if global food prices stabilize this year and **projections** of a record grain harvest hold, the underlying problems will remain.

So it was with North Korea. With emergency assistance, the country pulled back from the brink by 2000. In 2008, however, it is again in a **serious food crisis**, thanks to high energy prices, flooding, and a shortfall in last year's grain harvest. Once again, North Korea is the world's canary. As we sit in the dark in the deep hole that we've dug for ourselves, will we finally heed its warning?

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associate. He wrote this article for TomDispatch, a project of The Nation Institute, where it appeared on June 17, 2008. Published at Japan Focus on June 22, 2008.