Can the World Feed 10 Billion People?

With an exploding global population -- and Africa's numbers set to triple -- the world's experts are falling over themselves arguing how to feed the masses. Why do they have it so wrong?

BY RAJ PATEL | MAY 4, 2011

The world's demographers this week increased their estimates of the world’s population through the coming century. We are now on track to hit 10 billion people by 2100. Today, humanity produces enough food to feed everyone but, because of the way we distribute it, there are still a billion hungry. One doesn't need to be a frothing Malthusian to worry about how we'll all get to eat tomorrow. Current predictions place most of the world's people in Asia, the highest levels of consumption in Europe and North America, and the highest population growth rates in Africa -- where the population could triple over the next 90 years.

There are, however, plans afoot to feed the world. One of the countries to which the world's development experts have turned as a test bed is Malawi. Landlocked and a little smaller than Pennsylvania, Malawi is consistently among the world's poorest places. The latest figures have 90 percent of its 15 million people living on the equivalent of less than two dollars a day. By century's end, the population is expected to be nearly 132 million. Today, some 40 percent of Malawians live below the country's poverty line, and part of the reason for widespread chronic poverty is that more than 70 percent of Malawians live in rural areas. There, they depend on agriculture -- and nearly every farmer grows maize. "Chimanga ndi moyo" -- "maize..."
is life," the local saying goes -- but growing maize pays so poorly that few people can afford to eat anything else.

If you arrive in Malawi in March, just after the rainy season, growing food seems like a fool's game. It's hard to find a patch of red soil that isn't a tall riot of green. From the roadside you can see maize about to ripen, with squash and beans planted at the base of the thick stalks. Even the tobacco fields are doing well this year. But there's a rumble in this jungle. Malawi's swaying fields are a battleground in which three different visions for the future of global agriculture are ranged against one other.

The first and most venerable development idea for Malawi sees these farmers as survivors of a doomed way of life who need to be helped into the hereafter. Oxford economist Paul Collier is the poster child for this "modernist" view, one that he presented in a scathing November 2008 Foreign Affairs article in which he cudgeled the "romantics" who yearned for peasant agriculture. Observing both that wages in cities are higher than in the countryside, and that every large developed country is able to feed itself without peasant farmers, Collier argued the virtues of big agriculture. He also called on the European Union to support genetically modified crops and for the United States to kill domestic subsidies for biofuel. He was one-third right: biofuel subsidies are absurd, not least because they drive up food prices, siphoning grains from the bowls of the poorest into the gas-tanks of the richest -- with limited environmental gains, at best.

Collier's contempt for peasants seems, however, to rest on something other than the facts. Although international agribusiness has generated great profits ever since the East India Company, it hasn't brought riches to farmers and farmworkers, who are invariably society's poorest people. Indeed, big agriculture earns its moniker -- it tends to work most lucratively with large-scale plantations and operations to which small farmers are little more than an impediment.

It turns out that if you're keen to make the world's poorest people better off, it's smarter to invest in their farms and workplaces than to send them packing to the cities. In its 2008 World Development Report, the World Bank found that, indeed, investment in peasants was among the most efficient and effective ways of raising people out of poverty and hunger. It was an awkward admission, as the Bank had long been trumpeting Collier's brand of agricultural development. Farmers organizations from Malawi to India to Brazil had been pointing out that access to land, water, sustainable technology, education, markets, state investment in processing, and -- above all, access to level playing field on domestic and international markets -- would help them. But it took three decades of lousy policy for the development establishment to realize this, and they're not quite there yet.

Because of its colonial legacy, Malawi had long been following conventional economic wisdom: exporting things in which the country had a comparative advantage (in Malawi's case, tobacco) and using the funds to buy goods on the international market in which it didn't have an advantage. But when tobacco prices fall, as they have of late, there's less foreign exchange with which to venture into international markets. And being landlocked, Malawi also faces higher prices for grain than its four neighbors -- Zimbabwe, Mozambique, Zambia, and Tanzania -- simply because it costs more to transport into the country. According to one estimate, the marginal cost of importing a ton of food-aid maize is $400, versus $200 a ton to import it commercially, and only $50 to source it domestically using fertilizers. Particularly at a time when food and
fertilizer prices are predicted to rise, Malawi is wise to consider how vulnerable to the caprices of international markets it wants to be.

This partly explains why, in the late 1990s, almost a decade before it became fashionable, Malawi bucked the advice of its international donors and decided to spend the majority of its agriculture budget on fertilizer, the first and perhaps most necessary ingredient in prepping the soil for producing viable crops. The government gave farmers a "starter pack," with enough beans, improved seeds, and fertilizer to cover about a fifth of an acre. International donors weren't pleased. A USAID official decried the program as consigning farmers to a "poverty treadmill" in which farmers would be stuck growing just enough maize to survive, but never enough to get rich. Although the program had modest success, it took off when Malawian President Bingu wa Mutharika expanded the program over the 2005-2006 growing season, quadrupling the amount of fertilizer available. Although driven by domestic political promises, his international timing was perfect -- he was embarking on a policy whose time had come. And this is why what happens in Malawi's fields today matter so much beyond its borders.

To understand why, we need a quick history of agricultural policy in developing countries. Many developing countries were, especially before World War II, pantries to be raided by their colonizers. Post-independence, rural areas were often net contributors to government revenues, but there were some assurances of stability, with government schemes to buy crops at guaranteed prices. Internationally -- especially in Asia -- the post-war era saw governments pressured to feed a restive population that was increasingly wondering whether their lot wouldn't be improved through socialism and a change in land ownership. In order to fight the Cold War in foreign fields, the U.S. government and key foundations invested heavily in agricultural technologies such as improved seed and fertilizer. These technologies were designed to keep land in the hands of its feudal owners, food plentiful, and communists at bay. In 1968, William Gaud, the USAID administrator, dubbed it a Green Revolution, because it was designed to prevent a red one.

For a range of mainly geopolitical reasons, the Green Revolution was implemented with less fervor and success in Africa than in Asia. The International Fertilizer Development Center observed in 2006 that $4 billion worth of soil nutrients were being mined from the African soil by farmers who, struggling to make ends meet, weren’t replenishing the nitrogen, potassium, and phosphorous in the ground beneath their feet.

The prescription for declining soil quality lay, however, not in addressing the policy causes of farmer’s environmental panic -- a systematic neglect since the 1980s to which the World Bank itself admitted in an internal evaluation -- but to fix the soil with technology. So in 2006, the Rockefeller Foundation (the original sponsors of the Green Revolution in Asia) joined the Gates Foundation to launch The Alliance for a Green Revolution in Africa, or AGRA. This is the second brave new development policy that hopes to feed Africa.

AGRA claims to have learned the lessons of history, rejecting Collier’s view and focusing on policies that "unlike the Green Revolution in Latin America, which mostly benefited large-scale farmers because they had access to irrigation and were therefore in a position to use the improved varieties ... [are] specifically geared to overcome the challenges facing smallholder farmers."
So did it work in Malawi? It depends on the goal. If the aim was to increase output, then yes. Although economist and Earth Institute Director Jeffrey Sachs recently over-egged the data by suggesting that production had doubled because of the fertilizer subsidy (it only increased by 300,000 - 400,000 tons or up to 15 percent, the rest being mainly due to the return of the rains), the amount of maize in Malawi has undoubtedly gone up.

As the 50 million people food insecure in the United States know all too well, though, having enough food in the country doesn't necessarily mean that all people get to eat, and Malawi still has more than its fair share of glassy-eyed and underweight children. Chronically hungry kids have low height for their age and the number of children malnourished in this way -- "stunted" is the term in the statistics -- has remained stubbornly high since the subsidies began.

Measuring increased yields of maize from fertilizer and starter kits doesn't necessarily translate into a society that is well-fed and economically viable in terms of agriculture. Rachel Bezner Kerr, a professor of geography at the University of Western Ontario who also works in Malawi as a project coordinator for the Soils, Food and Healthy Communities Project, isn't surprised. "Any nutritionist would scoff at the notion that increased yield automatically leads to increased nutrition," she says.

Bezner Kerr told me that having more crops in the fields and bigger yields can actually be a bad thing, taking "women out of the home and away from domestic work. Particularly if they are doing early childcare feeding, this can lead to poorer nutritional outcomes." What happens within the household is crucial in translating increased output into better nutrition.

Indeed, gender matters when it comes to food and farming. Sixty percent of the world’s malnourished people are women or girls. Yet the U.N.’s Food and Agriculture Organization recently pointed out that by increasing access to the same resources as men, women could boost their farm's output by up to 30 percent, leading to a 4 percent increase in total agricultural output in developing countries. In Malawi, 90 percent of women work part time, and women are paid some 30 percent less than men for similar jobs. Women are also burdened with care work, especially in a country ravaged by HIV/AIDS. Even if they own land and have access to the same resources as men, women find themselves torn between the demands of child and elder care, cooking, carrying water, finding firewood, planting, weeding, and harvesting.

These problems are better addressed through social change -- abetted by programs like the Soils, Food and Healthy Communities Project -- than chemistry. Yet these are precisely the kinds of programs that are crowded out by fertilizer subsidies. The fertilizer program has been a jealous child, sucking resources away from other programs. The opportunity cost of fertilizer for farmers is money that might have been spent on something else -- a serious concern when global fertilizer prices are going through the roof.

Research by the World Bank in Latin America and Southeast Asia has suggested that it's smarter for government to subsidize public goods like agricultural research and extension services and irrigation, rather than directing money at private inputs like fertilizer.

Again, this matters beyond Malawi's borders, particularly in sub-Saharan Africa. The world’s population growth is scheduled to be driven by "high fertility countries" -- most of which are in Africa. The UN Special
Rapporteur on the Right to Food, Olivier de Schutter, recently argued that the world might be better fed not by pumping the soil with chemicals, but by using cutting-edge "agroecological" techniques to build soil fertility, and using policy to achieve environmental and social sustainability. In a review of 286 sustainable agriculture projects in 57 developing countries covering 91 million acres, a team led by British environmental scientist Jules Pretty found production increases of 79 percent -- again, far higher than the fertilizer subsidy in Malawi, and with a far broader range of ecological and social benefits than increased food production.

These programs succeed, in part, because they don't see hunger as the consequence of a surfeit of peasants or a deficit in soil, but as the result of complex environmental, social, and political causes. You don't just need chemists to solve hunger -- you need sociologists, soil biologists, agronomists, ethnographers, and even economists. Paying for their skills is the opportunity cost of spending precious dollars on imported fertilizer. Of course, agroecology is an entirely different paradigm than one in which technology is dropped into laps from foreign laboratories accompanied by a sheet of instructions. The programs require much more participatory education work, and much more investment in public goods, than the Malawian government and donors currently seem inclined to provide.

Agroecology is the third development vision battling for the future. In Malawi, it works. By growing cowpeas and groundnuts with maize -- expanding the range of crops -- Bezner Kerr's program has beat the fertilizer program's yield by 10 percent and increased nutrition outcomes too. Yet even agroecology has its limits. Fifteen percent of Malawians remain ultra poor, living on less than a dollar a day and unable to buy enough to eat. They tend to be people who are landless, or who have poor quality land and have to sell their labor at harvest time, just when they need it the most. They remain untouched by the Malawian miracle.

The future doesn't look terribly promising for agroecology. Concerned about the financial sustainability of its fertilizer subsidy program, the Malawian government is about to embark on a Green Belt project, in which thousands of acres will be irrigated to induce foreign investors to begin large-scale farming of sugar cane and other export crops. The foreign exchange brought in by this program, it is hoped, will bankroll the fertilizer spending. The result will help balance the country's current account, but as a consequence, thousands of smallholders are scheduled to be displaced to clear lands that will attract the kind of large-scale agriculture of which Collier would approve.

Particularly in the light of the new population projections for the 21st century, it seems foolish to stick to 20th century agricultural policy. Recall that the agroecological interventions in Malawi turned on women's empowerment. Nobel Laureate Amartya Sen has famously argued that there are few policies better placed to improve individual, family, and community lives (and lower fertility rates) than education -- particularly the education of women and girls. The prophesies presented to us by demographers vary widely -- change the assumptions, and you end up with a world of between 8 billion and 15 billion people. No matter what the future holds, though, it's clear that a world in which everyone gets to eat depends on women's empowerment -- and rather than treating that fact as something irrelevant to feeding the world, agroecology puts it right in the middle.

A great deal of past agriculture policy has been designed either economically to bomb villages in order to
save them, or to administer a technological quick fix in order to postpone politics. Collier wants to get rid of peasants. New fads want to keep them, but keep them knee-deep in chemicals. Yet if we are serious about feeding the hungry, in Malawi or anywhere else, we need to recognize that the majority of the hungry are women, and that we need more public, not private, spending on those least able to command rural resources. Because when it comes to growing food, those who tend the land are anything but fools.