

Digging into the Green Revolution

Does Asia need another green revolution, or do we need to save it from one?

BY Floyd Whaley

Joel Maliwag has a strategy for making the 1.5-hectare rice farm that he works in the northern Philippines a success: he doesn't grow much rice on it.

Only about a third of the farm is devoted to rice. On the rest of the land, he has fruit trees, vegetable gardens, chickens, and a fishpond. He's even producing some traditional medicine.

"Rice farming doesn't earn enough to support a family," says Maliwag, who is part of a Philippine government program called *Palayamanan*, or the Wealth in Rice Project. It teaches rice farmers to diversify beyond rice to boost their income and guard against devastating weather events and unpredictable market forces.

"This is the only way they will survive," says Rizal Corales, who heads the program. "Rice farmers can't live on growing rice alone."

Maliwag doesn't have much to say about the green revolution that brought high-yield farming to Asia 4 decades ago with the hopes of making small farmers profitable so they could help feed the region. He's busy feeding chickens and watering tomato plants.

A DEBATED LEGACY

The legacy of the green revolution is a matter of much debate. But all sides agree that it didn't pan out the way most had hoped. Proponents say the achievements have waned, and



FATHER OF THE GREEN REVOLUTION
Norman Borlaug, often credited with sparking the green revolution, won the Nobel Prize for developing disease-resistant wheat and helping save millions of lives through high-yield farming.

opponents say the movement did more damage than good.

During the 1940s, a little known agronomist named Norman Borlaug helped establish, with the backing of the Rockefeller Foundation, an organization that attempted to bring United States-style high-yield farming techniques to Mexico. The hearty high-

yield wheat that he helped develop transformed Mexico from an importer of wheat to an exporter in fewer than 2 decades.

By the 1960s, Borlaug and the ideas he promoted of breeding crops to increase their yield had moved to India. Coined the "green revolution" in the late 1960s, Borlaug brought not only new genes, but also new thinking about fertilizer and irrigation to a country with ancient farming traditions. Wheat production in the country nearly doubled using his methods, from 12 million metric tons in 1965 to over 20 million in 1970.

Borlaug's methods spread worldwide, with green revolutions taking place in Pakistan, Turkey, Afghanistan and elsewhere. In 1970, Borlaug won the Nobel Peace Prize for his work and the impact it had on world hunger.

MIRACLE RICE

Borlaug's primary success was with wheat, which is relatively easy to grow and naturally resistant to pests. In the Philippines in the 1960s, researchers worked long hours at the International Rice Research Institute (IRRI) to bring Borlaug's dream of a green revolution to rice production in Asia.

"At the time, it wasn't just an issue of hunger. People were talking about mass starvation in Asia and around the world," says Kwanchai Gomez, who



HARVEST FOR THE WORLD Many agribusiness corporations that support high-yield farming say a second green revolution is needed to bring down world hunger.

was with IRRI in many roles for more than 3 decades. “We were working to reverse what we saw as a trend toward starvation. People were scared.”

IRRI worked on the problem with a variation of methods used by rice farmers for centuries. Farmers have traditionally tried to separate, or purify, their best seeds in hopes of planting the most productive strains. At IRRI, scientists in the laboratory made dramatic strides in increasing yields through similar, though systematic, cross-pollination.

In 1966, IRRI research isolated a rice variety with the technical name IR8, later dubbed “Miracle Rice” by nonscientists, which doubled the yield of regular varieties. Miracle Rice was credited with increasing rice production in the Philippines from 3.7

tons to 7.7 tons in 2 decades, according to a report from the Food and Agriculture Organization of the United Nations (FAO).

Mass starvation never took place, and some say today that it was as much hype as a real threat. And despite the dramatic increases in productivity in many countries around the world, the green revolution also did not eliminate world hunger, as many had hoped. There are more than 1 billion undernourished people worldwide today, decades after high-yield

farming was introduced, according to the United Nations’ World Food Programme.

“That means one in nearly six people do not get enough food to be healthy and lead an active life,” the agency notes in a recent report. “Hunger and malnutrition are in fact the number one risk to the health worldwide—greater than AIDS, malaria, and tuberculosis combined.”

ANOTHER REVOLUTION

Many of the agribusiness corporations that embraced the green revolution say it must be repeated to bring down world hunger. Bayer CropScience, a German-based agribusiness giant with more than 18,000 employees in 120 countries, outlines a bleak situation if high-yield agriculture is not quickly used worldwide.

According to the company, historically low global food reserves cannot be replenished by increasing the amount of land used to produce food. Meanwhile, demand is rising, not only for food, but also for animal feed and

“No one has yet to be able to find a way to improve distribution of any crop, let alone rice, and have a real impact on world hunger”

—Kwanchai Gomez, executive director of the Thai Rice Foundation



ASIA'S STAPLE Rice feeds about half of humanity but only a few countries have a large surplus in supply. Even some of the world's biggest producers are hard-pressed to grow enough to feed their own people.

plants to produce biofuels. Climate change could make the situation dramatically worse.

"We need intensive research into agriculture so that we can meet the challenges of food production and also make the best possible use of our arable resources," says Friedrich Berschauer, chairman of the board of Bayer CropScience. "What we need is nothing less than a second green revolution."

On the other side of the debate, agricultural researcher Peter Rosset notes in a report for the Institute for Food and Development Policy, also known as Food First, that the green revolution created more hunger than it relieved.

"Hunger is not caused by a shortage of food, and cannot be eliminated by producing more," says Rosset. "This is why we must be skeptical when

Monsanto, DuPont, Novartis, and other chemical-cum-biotechnology companies tell us that genetic engineering will boost crop yields and feed the hungry."

"The technologies they push have dubious benefits and well-documented risks, and the second green revolution they promise is no more likely to end hunger than the first," says Rosset.

Gomez, who is now the executive director of the Thai Rice Foundation, the rice organization supported by the Thai monarchy, questions the notion that better food distribution will solve world hunger.

"This is the notion that if you have this much rice, then you can feed everyone in the world," says Gomez. "But how do you manage this? If it could have been done, it would have been done. No one has yet to be able to find a way to improve distribution of

Rice's Pricey Odyssey from the Field to the Table

The availability and price of rice for consumers in Asia is based on a maze of people, regulations, and natural events

Research by Floyd Whaley
Sources: *From Seed to Shelf*. Ordonez, E., and Associates. 2005.
The Rice Price Crisis. Why is it happening? International Rice Research Institute website.



1 THE AGRICULTURAL RESEARCHERS

Government funding has been slashed for the scientists who come up with higher yield and more durable varieties of rice. Developing new varieties of rice is a time-consuming process that must be funded years before a crisis develops.

2 THE FARM SUPPLIERS

Prices for fertilizers have risen dramatically, and the cost of urea, an inorganic compound important for use in farming, has nearly doubled in the past 4 years. Some suppliers offer materials at high prices and take payment upon harvest.



3 THE FARMERS

Rice farmers have less land, due to other uses such as urban development and switching to more lucrative cash crops, and they are producing less rice on the land that they do have. Contributing to the problem are pesticide-resistant pests and extreme weather events, such as storms, droughts, and floods.

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Gomez notes that though scientifically based high-yield agriculture has its problems, it has shown results in helping to address world hunger in the past and can do so again. “Scientists are single minded,” she says. “When they intend to do something, there is a possibility of success. Distribution is a political problem, and for politicians, success is getting elected again.”

BREEDING HOSTILITY

Borlaug, the father of the green revolution who died in September 2009, fell out of favor by some in recent years as high-yield intensive agricultural techniques became more controversial. In a 1997 interview with *The Atlantic Monthly* magazine, he dismissed criticism of his techniques,

which many believe have saved hundreds of millions of lives.

“Some of the environmental lobbyists of the Western nations are the salt of the earth, but many of them are elitists,” he told the magazine. “They’ve never experienced the physical sensation of hunger. They do their lobbying from comfortable office suites in Washington or Brussels. If they lived just one month amid the misery of the developing world, as I have for fifty years, they’d be crying out for tractors and fertilizer and irrigation canals and be outraged that fashionable elitists back home were trying to deny them these things.”

Bill Gates, the founder of the Bill & Melinda Gates Foundation, which has donated \$50 million for rice research in Asia, calls Borlaug “a genuine hero” and says the green revolution cut global hunger in half.

In a statement from his foundation, Gates cautioned that progress toward easing global hunger is “endangered by an ideological wedge that threatens to split the movement in two. On one side, there are groups that support technological solutions to increase agricultural productivity without proper regard to environmental and sustainability concerns. On the other, there are those who react negatively to any emphasis on productivity.”

“It’s a false choice, and it’s dangerous for the field,” Gates says. “It blocks important advances. It breeds hostility among people who need to work together. And it makes it hard to launch a comprehensive program to help poor farmers. The fact is, we need both productivity and sustainability—and there is no reason we can’t have both.” ■



4 THE RICE TRADERS AND MILLERS
In some countries, traders manipulate small cash-strapped farmers by offering high-interest loans, or supplies such as seeds and fertilizer, against a set price for the harvested rice. This allows some traders to set artificially low prices for the crop. Both millers and traders (and others in the production chain) sometimes hoard rice to speculate on rising prices.

5 THE GOVERNMENT
Governments stockpile rice for emergency uses, and as a way to intervene in the market and keep prices down. Many of these stockpiles have decreased dramatically in the last decade and removed one of governments’ key tools in controlling price hikes. Many governments have also decreased their investments in irrigation infrastructure, which allows rice farmers to harvest more than once a year.



6 THE WHOLESALERS, RETAILERS, AND EXPORTERS
This group also hoards stocks of rice at times to speculate on increasing prices, but can also drive up prices due to high fuel costs because they bear the brunt of getting rice to market and the costs of shipping overseas.



7 THE CONSUMER
More people in more countries are consuming rice, including in Africa, which now consumes one-third of the world’s total trade in rice, and the prosperous Middle East, which has increased demand and driven up prices. Globally, the demand for rice is increasing by about 5 million tons each year, which means that in 10 years the world will need to produce 50 million tons more than it does now. Panic buying by domestic consumers also causes artificial price hikes. ■