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Can Danilo Atilano Feed the World?

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Industrial agriculture advocates say organic farming cannot produce enough food for 7 billion people. A group of rice farmers in the Philippines is proving them wrong.

Danilo works in his rice farm. Photo by John Cavanagh.

Danilo Atilano leads us onto the moist soil from which his waist-high stalks of rice grow. It is four o'clock in the afternoon. He has selected this time to meet because this is when "the vegetation is wet with dew and comes alive with insects." In Hollywood, spiders star in horror movies; in Atilano's rice field, they are "friends" doing good deeds like eating larvae of "bad" stem borers. We point with concern to bright red snail eggs on the soil. Atilano shrugs them off. Snails are pests during planting, he explains, because they eat young rice-shoots. Close to harvest, they become weed-eating friends.



We are in the rice fields of the southern Philippines to discover whether small-scale, organic farmers like Atilano can grow enough food to feed the world's population. Mainstream agricultural experts say no. They believe these small farmers are backward and unscientific, and simply cannot grow sufficient food to meet the world's daily caloric needs. Instead, the experts bet on large-scale agribusiness using "high-yielding" genetically modified seeds that require chemical inputs to grow. Yet roughly 2 million farmers around the world, including Atilano, have switched from chemical to organic methods. But the question remains: Can the Danilo Atilanos of the world feed the planet?

Atilano is slight in build, with a shy but engaging smile. As we walk through his hectare of neat, nearly mature, green rice stalks, he says proudly: "It is all zero-chem," the local term for organic. He tells us about the traditional seeds he has planted. With chemical agriculture, farmers must buy new hybrid seeds each planting season, a costly proposition. The traditional seeds Atilano and other organic farmers in his area use are saved from the previous harvest or are "in-bred" locally to work best in local soils and

ecosystems. Atilano complains that, over the years, the government's agricultural agents have distributed free hybrid seeds and focused seminars and trainings on chemical agriculture rather than supporting zero-chem farming.

Organic farming's simple economics prompted Atilano to make the switch from chemical agriculture eight years ago. He calculates that once he shifted to zero-chem farming, his costs fell from about \$400 each planting-to-harvest cycle to roughly \$160, while his yields dipped only slightly. Bottom line: he earns much more money. Each of the more than two-dozen organic farming families we speak with in the Philippines similarly reports lower costs.

Later, when we ask Atilano and other local organic farmers to respond to allegations that they cannot deliver the higher yields required to feed a growing and hungry world, they recount with disdain the 1960s and 1970s, when the new hybrid rice varieties ushered in the so-called "green revolution." Initially, most say, expensive seeds, chemical fertilizers, pesticides, and irrigation often produced increased yields. But productivity fell over the years as soils became compacted and depleted of nutrients. Faced with the high costs of inputs, farmers took on debt or decreased pesticide and fertilizer use, reducing yields further. As debts grew, some had to sell their cherished land.

As we chat with Atilano, "farmer scientist" Carlito Cubio pulls up on his motorcycle. Cubio works for a local nonprofit group – the Davao Provinces Rural Development Institute (DPRDI) – that helps farmers shift to organic rice cultivation. Cubio is humble, yet animated, with an easy, jovial manner. A farmer himself, he knows that decisions about rice are life and death, and he treats Atilano with deep respect. Atilano had contacted Cubio because some of his rice leaves had turned red. The two of them contemplate whether to ignore the red leaves or spray them with something they call a "concoction." They decide to make the final choice the next day when Cubio will stop by again.

When we inquire about the "concoction," Cubio invites us to his home in a nearby barrio for a cooking demonstration. There, in Cubio's yard, his wife Rosita and two female neighbors show us how to make the natural brews that have replaced chemical fertilizers and pesticides in local organic agriculture. They light a fire under a large caldron filled with water, and then they talk to us about these mixtures.

"In 1997, the DPRDI taught us how to make eight different concoctions," one of the Cubios' neighbors explains. "Some are made with fermented fruits, some with vegetables, some with fish bones or egg shells, or with seaweed. Some help prepare the soil; some discourage certain viruses or pests." Another neighbor continues: "All the ingredients are grown here or available at the local market. Each member of our group focused on cooking one of the concoctions, and we sold quite a bit in the first few years."

Rosita Cubio laughs as she describes their short-lived financial success: “Then, because concoctions are easy to make and we shared the recipes, many farmers learned to make them on their own, and our sales went down.”

The next afternoon we return to Atilano’s rice field. Obviously relieved, he tells us that he and Carlito have decided that the red leaves are not dangerous at this point in the growing cycle. Instead, Atilano’s nephew is spraying a seaweed concoction (from an earlier batch made by Rosita’s group) to help keep the rice stalks firm as they grow.

As we watch Atilano’s nephew spray, we realize how far organic farming has evolved from simple composting. These days it requires a mix of science, math, common sense, and, of course, hard work. Unlike chemical farming, every day on an organic farm brings a new challenge – weeding, monitoring insects, and weighing options. Atilano does not find this overwhelming. He finds it empowering.

A few days later, in a nearby province, we meet Elsie and Romeo Madis in an open-air bamboo hut by their five hectares of irrigated rice fields to learn about their switch to organic agriculture roughly half a dozen years ago. Romeo, a quiet, powerfully built man, starts: Before, because of the high costs of seeds, fertilizer, and pesticides, “already during land preparation, we regularly incurred debts from the middle-men and lenders. By harvest time, there was very little left, sometimes not even enough to repay the lenders and get new loans for the next cropping. That was the cycle; always lots of debt.”

Then they attended a training on organic agriculture led by a local nonprofit called the Don Bosco Foundation for Sustainable Development. Elsie was convinced. Romeo was skeptical: “As I saw it then, if I’m not going to spray chemicals, how will there be a harvest?” They compromised with a trial organic rice crop on the hectare Elsie had inherited from her father. The result was phenomenal: Costs plummeted and their income rose.

Betsy Ruizo-Gamela, director of the Don Bosco group that has helped thousands of Filipino farmers shift to organic methods, confirms that some farmers, like Romeo and Elsie Madis, experience increased yields right away when they make the switch. Others, like Atilano, tell us that their yields fell somewhat in the first two or three seasons, but once the soil has been replenished, they usually get higher yields.

Numbers support the anecdotal evidence we have been gathering. “Organic rice yields of those who have been practicing already for [three to five] years now ranges from 100 to 130 sacks a hectare, which is higher than hybrid rice yields,” Philippine Development Assistance Programme Director Jerry Pacturan reports. “The national average for hybrid rice is only about 80 to 100 sacks a hectare.”

Back at their farm, Romeo Madis tells us his health improved with the switch to zero-chem. “I compare my body to the rice,” he says. Other farmers we interview also speak of health problems – from “yellowish skin” to dizziness to stomach ailments – that disappeared after the switch. Many farmers were aware the chemical inputs were affecting their health, but kept using them because they did not feel they had an alternative. As one woman farmer explains: “All the while [using chemical agriculture], I understood the health effects. We were committing suicide.”

Many organic farmers we meet are diversifying their crop, which not only helps them be more self-sufficient food-wise, but is also good for soil fertility. Alongside the organic rice paddies, families grow fruit trees (mango, jackfruit, papaya) and vegetables (string beans, green leafy vegetables, squash). Small fishponds border some of the rice fields, providing a safe source of protein. (Chemical agriculture leaches toxins into fishponds that would bio-accumulate up the food chain.)

After spending time with Atilano and his fellow organic farmers, we are convinced that they can grow ample food to feed their families and communities. But what about feeding the rest of the world? Could small-scale, organic farms grow enough to ensure everyone on this planet had access to adequate food?

A December 2010 study by the United Nations Special Rapporteur on the Right to Food, Olivier de Schutter, provides the most authoritative answer. According to de Schutter, “Recent [agroecology] projects conducted in 20 African countries demonstrated a doubling of crop yields over a period of 3-10 years.” De Schutter’s study and a comprehensive “State of the World 2011” report on the future of food by the Worldwatch Institute present substantial empirical evidence, across many crops and countries, of major increases in yields for farmers practicing “agroecology.” Agroecology extends the “zero-chem” label to a broader category of ecosystem-friendly, locally adapted agricultural systems, including agro-forestry and techniques like crop rotation, topsoil management, and watershed restoration. In addition to increasing yields, the UN and Worldwatch experts conclude that agroecology can reduce greenhouse gas emissions and increase farmers’ incomes, which in turn reduces hunger.

De Schutter’s findings reinforce what US food expert Frances Moore Lappé has been arguing for decades: We already grow more than enough food to feed the world’s people.

The problem is not yields or production per se; it is that conventional plantation agriculture, combined with a development model that prioritizes cheap exports over food crops, have pushed millions off their fields. The nearly one billion people who are hungry are in that situation primarily because they no longer have land to grow their own food or because they are too poor to buy food.



If the Philippines switched from white rice to brown rice, it could eliminate the need to import the grain. Photo by International Rice Research Institute.

De Schutter emphasizes: “We won’t solve hunger and stop climate change with industrial farming on large plantations. The solution lies in supporting small-scale farmers’ knowledge and experimentation, and in raising incomes of smallholders so as to contribute to rural development.”

Small-scale farmers using agroecology approaches can produce ample and accessible food for the world’s people. So, the question is not really if farmers like Atilano can feed the world. The question is whether eco-friendly, smallholder farmers like him will get the support they need to feed the world.

Picture the contest over the future of food and farming as a shifting battlefield with many players. On one side, agribusiness firms, some development agencies, technocrats, and academics like Robert Paarlberg, author of *Food Politics: What Everyone Needs to Know*, continue to push the myth that only agribusiness plantations can feed the world. Their battle cry: Countries should shift fertile lands to “efficient” and “modern” large-scale export crop production, even if it means increasing food imports to feed their people.

On the other side are policy experts like de Schutter and hundreds of millions of small farmers and consumers. Groups representing about 200 million small-scale farmers in 70 countries have united in *La Via Campesina*, a movement that promotes “food sovereignty,” by which they mean “defending small-scale farming, agroecology and local production.” They, in turn, are supported by thousands of community and consumer groups – such as the Slow Food movement, whose 1,300 chapters in 153 countries support small farmers, co-ops, and community-supported agriculture across the world.

The outcome of this war over the future of food depends on two things: who wins the policy battles over food, and what personal food choices each of us makes on a daily basis.

Food decisions made at billions of dinner tables each day have a huge impact on whether small farmers will feed the world. To use the phrase of the slow food movement, you – we – have a huge say in the future of food and farming by “voting with your fork.”

A notable example: Are you eating whole or heavily refined grains? After Atilano harvests his rice, it goes to a mill. There, the rice is cleaned and husks removed, leaving “brown” or “unpolished” rice grains. At this point, there remain several thin layers of wholesome bran, full of vitamins, minerals, and protein – including some that guard against diabetes. Most rice mills peel these last layers off and polish what remains into shiny, white rice bereft of most vitamins and minerals. By our calculation, if the Philippines, currently one of the world’s top rice importers, switched to eating unpolished rice, it could eliminate rice imports altogether since each grain would contain more calories and nutrients. Similar stories can be told for wheat and corn.

On the policy front of this war, the future largely boils down to which vision of farming and food governments, development agencies, and wealthy philanthropists like Bill Gates choose to support.

Most of the world’s farmers are still small-scale, and the fate of the small, but growing, percentage of those practicing organic and other forms of agroecology depends heavily on government policy. In this sense, governments vote with their policy “forks.” They set – or agree to – trade and other policies that determine whether they will achieve food sovereignty or whether cheap food imports will flood their markets. Farmers also need public investment to facilitate their shift to organics, just as governments and international aid agencies initially subsidized the transition to chemical agriculture.

During our many visits to the Philippines over the decades, we have watched as pineapple and banana plantations spread near Atilano’s rice fields, not only encroaching on rice paddies, but also hijacking the water that rice farmers need for their crop. This government-sanctioned trend is not unique to the Philippines. Across the world, big global corporations, now joined by governments of countries like China and the Arab Gulf states, are displacing small, local farmers and gobbling up land to produce food, animal feed, and biofuels, mainly for export.

But today things do not look so rosy for the “Big Ag” side of the food war. Over the past four years, as food prices surged, the export-oriented agribusiness side has come under heavier attack. In the second half of 2010, wheat prices doubled. By April 2011, when food costs surpassed the record levels of 2008, angry citizens staged huge protests in many countries. Anti-government protesters across the Middle East included lower food prices among their demands. Many governments, understandably nervous about soaring food prices and local protests, are beginning to show interest in farmers like Atilano.

This is indeed what is happening in the Philippines: The agriculture ministry, long a position for agribusiness allies, is currently headed by Proceso Alcala, a strong proponent of organic agriculture. Within a year of his appointment in mid-2010 – and just months after we had walked through Atilano’s

fields – we learned that the Philippine agriculture department had stopped subsidizing chemical fertilizers and was steering public funds into community-based seed banks for traditional rice varieties. Alcala, we heard, was hiring community-based farmer-scientists and gearing up for an “eat healthy” campaign that will champion brown rice and other healthy foods.

This is just one example of how governments, policymakers, and ordinary citizens across the world are rethinking who should grow our food – and how food should be distributed and consumed. The current moment should mark a turning point toward a world where more of us will be fed by farmers like Danilo Atilano. Our health, our societies, and our environment – our future – depend on it.