PALENCIA, Guatemala - Mario Chinchilla, his face shaded by a battered straw hat, worriedly surveyed his field of sickly tomatoes. His hands and jeans were caked with dirt, but no amount of labor would ever turn his puny crop into the plump, unblemished produce the country's main supermarket chain displays in its big stores.

For a time, the farmer's cooperative he heads managed to sell vegetables to the chain, partly owned by the giant Dutch multinational, Ahold, which counts Stop & Shop among its assets. But the co-op's members lacked the expertise, as well as the money to invest in the modern greenhouses, drip irrigation and pest control that would have helped them meet supermarket specifications.

Squatting next to his field, Mr. Chinchilla's rugged face was a portrait of defeat. "They wanted consistent supply without ups and downs," he said, scratching the soil with a stick. "We didn't have the capacity to do it."

Across Latin America, supermarket chains partly or wholly owned by global corporate goliaths like Ahold, Wal-Mart and Carrefour have revolutionized food distribution in the short span of a decade and have now begun to transform food growing, too.

The megastores are popular with customers for their lower prices, choice and convenience. But their sudden appearance has brought unanticipated and daunting challenges to millions of struggling, small farmers.

The stark danger is that increasing numbers of them will go bust and join streams of desperate migrants to America and the urban slums of their own countries. Their declining fortunes, economists and agronomists fear, could worsen inequality in a region where the gap between rich and poor already yawns cavernously and the concentration of land in the hands of an elite has historically fueled cycles of rebellion and violent repression.

"It's like being on a train with a glass on a table and it's about to fall off and break," said Prof. Thomas Reardon, an agricultural economist at Michigan State University. "Everyone sees the glass on the table - but do they see it shaking? Do they see the edge? The edge is the structural changes in the market."

In the 1990's supermarkets went from controlling 10 to 20 percent of the market in the region to dominating it, a transition that took 50 years in the United States, according to researchers at Michigan State and the Latin American Center for Rural Development in Santiago, Chile.
Brazil, Argentina, Chile, Costa Rica and Mexico are furthest along. While the changes have happened more slowly in poorer, more rural Central American countries, they have begun to quicken here, too. In Guatemala, the number of supermarkets has more than doubled in the past decade, as the share of food they retail has reached 35 percent.

The hope that small farmers would benefit by banding together in business-minded associations has not been borne out. Some like Aj Ticonel, in the city of Chimaltenango, have succeeded. But the evidence suggests that the failure of Mr. Chinchilla's co-op is the more common fate.

Its feeble attempts to sell to major supermarkets illustrate how the odds are stacked against small farmers, as well as the uneven effects of globalization itself. Many small farmers in the region are getting left behind, while medium-sized and larger growers, with more money and marketing savvy, are far more likely to benefit.

Most fruits and vegetables in the region are still sold in small shops and open-air markets, but the value of supermarket purchases from farmers has soared and now surpasses that of produce exports by two and half times, researchers say.

The bottom line: supermarkets and their privately set standards already loom larger for many farmers than the rules of the World Trade Organization.

Still, stiff competition from foreign growers is also quite real. To enter the supermarkets of Guatemala's dominant supermarket chain, La Fragua - part of a holding company one-third owned by Ahold - is to understand why Professor Reardon likens them to a Trojan horse for foreign goods.

At La Fragua's immense distribution center in Guatemala City, trucks back into loading docks, where electric forklifts unload apples from Washington State, pineapples from Chile, potatoes from Idaho and avocados from Mexico.

The produce is trucked from here to the chain's supermarkets, which now span the country. Scenes at a mall in Guatemala City anchored by Maxi Bodega, one of the company's stores, suggest the evolving nature of grocery shopping for Latin America's 512 million people.

On the ground floor was a sprawling, old-fashioned produce market. At the entry, there was a shrine to its patron saint, the Virgin of Rosario, who had plastic flowers sprinkled at her queenly feet.

The sound of women patting out tortillas and the sweet smells of ripe tropical fruits drifted through the market as people stopped to squeeze the avocados, sniff the pineapples and haggle for cheaper oranges.

To go upstairs was to leave Guatemala behind and enter a mall that could be in Bangkok or New York, with its synthetic Christmas wreaths, cheap clothing stores and oversized
discount packages of napkins and symmetrical tomatoes in plastic trays at the Maxi Bodega.

The Baldetti family exemplified the generational change unfolding here.

Delia Baldetti, an 81-year-old housewife, will only shop for produce amid the heaps of tomatoes, chilies and papayas where she can bargain to her heart's content. Her daughter Elsa, a 56-year-old painter, shops both here and at Maxi Bodega, while Elsa's daughter, a 36-year-old business administrator, only has time for the supermarket.

Elsa wistfully predicted that while the country's fragrant, raucous markets will never disappear, they will diminish. "We'll lose some of our identity," she said. "We're copying the foreigners."

Farmers who do not or cannot afford to change fast enough to meet the standards set by supermarkets are threatened.

The tiny farming community of Lo de Silva clings to a steep, verdant hillside. Slanting cornstalks look as if they would slide into the valley if they were not rooted to the earth.

Some of the more than 300 farmers who originally belonged to Mr. Chinchilla's co-op, the Association of Small Irrigation Users of Palencia - known by its Spanish acronym, Asumpal - were from this village. Only eight remain. The only product they still sell is salad tomatoes - and they sell to middlemen, not supermarkets.

José Luis Pérez Escobar, 44, a member of the co-op, scratched out a living for 20 years from his small field, perched in the clouds here.

But after his potato crop failed last year, he migrated to the United States to save his land from foreclosure by the bank, leaving his wife, María Graciela Lorenzana, and their five children behind. He now works the graveyard shift at a golf course in Texas for $6 an hour so he can pay his debts.

He had dreamed his cooperative would help him escape poverty by selling directly to the supermarkets. "It would be magnificent," Mrs. Lorenzana recalled of that more hopeful time. "The small farmer would not need a middleman. But he was never able to achieve it."

A Transformation Begins

The transformation of Latin America's food retailing system began in the 1980's and accelerated in the 1990's as countries opened their economies, often to satisfy conditions for loans from the International Monetary Fund and the World Bank. As foreign investment flooded in, multinational retailers bought up domestic chains or entered joint ventures with them.
Most concern about the perils of globalization for local farmers has focused on unfair trade competition from heavily subsidized American and European producers.

But increasingly, supermarkets also leave small farmers exposed as the stores spread from big cities to small towns, from well-to-do enclaves to working-class neighborhoods, from richer countries to poorer ones.

The chains now dominate sales of processed foods and their share of produce sales is growing. In Guatemala, supermarkets still control only 10 to 15 percent of fruit and vegetable sales. But in Argentina, their slice has grown to as much as 30 percent, while in Brazil they control half the market, according to Professor Reardon.

As the chains' market share expands, farmers who are shut out find themselves forced to retreat to shrinking rural markets.

The changes would not be so troubling if the region's economies were growing robustly and generating decent jobs for globalization's losers. After all, supermarkets are providing consumers with cheaper, cleaner places to buy food, economists say.

"It would be an appealing transformation of the sector if alternative jobs could be made available," said Samuel Morley, an economist at the International Food Policy Research Institute in Washington.

But economic growth has not kept pace with rising populations. The number of people living below poverty lines in Latin America has risen from 200 million in 1990 to 224 million this year. More than 6 in 10 people living in rural areas are still poor.

Given the difficulties small farmers face in doing business with multinational corporations, traditional strategies, like providing peasants with fertilizer and improved seeds, now seem quaint here.

Professor Reardon and Julio A. Berdegué, an agronomist who heads the Latin American Center for Rural Development, are collaborating with supermarket researchers across Asia and Africa, as well as Latin America, to document the trends.

In addition, a team at Michigan State has financing from the United States Agency for International Development to help small farmers in Central America, India and Kenya sell to supermarkets. They and other development experts are brainstorming about what to do.

Among the ideas: Regulations requiring that farmers be paid promptly. Enforcement of laws meant to curtail monopolies and oligopolies, including mergers of supermarket chains. Improved security and cleanliness at open-air markets. Infusions of credit and technical expertise for co-ops.
But while such cooperatives are almost certainly necessary if small growers are to amass the clout and scale to sell to multinational chains, they have been a disappointment so far.

Even in economically vibrant Chile, which has invested $1.5 billion in small-scale farming since 1990, a study of 750 farmer organizations found that 8 of 10 had failed or survived only with continuous infusions of government aid.

Mr. Berdegué, author of the Chile study, had sought to make the associations work in the 1990’s when he was a senior government official there. The pressure from the I.M.F. and the World Bank to allow greater foreign investment was intended to make Latin American economies more competitive.

"But the model did not have a social dimension at the real center," he said. "It was trickle-down economics."

**An Experiment Disappoints**

Mr. Chinchilla, 46, drove his battered, 20-year-old pickup, laden with crates of tomatoes, into his cooperative's spacious packing shed. The building and the business are in decay.

The water had been cut off. Toilets no longer flushed. The roof was missing over the bathroom, its floor covered with bird droppings. The live-in caretakers who sort the co-op's tomatoes had only an open pail of rainwater to wash their hands. They wore no gloves while handling the fruit.

Typically, each farmer is growing less than an acre of salad tomatoes in rustic greenhouses that are fast deteriorating. Their production has plummeted because of the blight that dries out the plants, which then yield very small tomatoes.

"We haven't found a solution," María Antonietta Muralles, a co-op member, said with a shrug. "Maybe it's the water."

Mr. Chinchilla treated his plants with pesticides to no effect. "You can't fight it with chemicals," he said. Maybe the soil itself is infected, they speculated.

"Everything costs money," he explained - money he does not have and cannot afford to borrow at the going rate of 21 percent. "When you don't have access to credit, you can't expand," he said. "We don't want anything given to us, but we need a hand."

As the farmers talked, two workers separated tomatoes by size, with the shrunken ones far too numerous. But their co-op's hopes of selling to big supermarket chains withered well before the plants. The co-op got started in the late 1990's, with a small grant from the government to upgrade the packing shed. An agronomist, Candelario López, was given a two-year contract, also at government expense, to advise them.
Over the next couple of years, Mr. López helped the co-op get its foot in the door with La Fragua and C.S.U., another major supermarket chain. The chains have since united to become the Central American Retail Holding Company, with 332 stores and almost $2 billion in sales in 2003. It is one-third owned by Ahold, which had more than $68 billion in sales last year.

But the co-op did not manage to supply the big chains for long. The farmers themselves were uncomfortable with the rules of the supermarket game. They found it difficult to wait weeks to get paid. They did not want to sell their vegetables on the books and pay taxes that sharply cut profits. And some of what they supplied was rejected as too bruised or too limp or too ripe.

The co-op's leaders said they quit selling to C.S.U. through its dedicated wholesaler in 2000 after two container loads of vegetables got held up for days at the Nicaraguan border, severely damaging the produce. "We weren't prepared to absorb that kind of loss," said Marco Tulio Alvizures, who then headed the co-op.

Perhaps more fundamental, co-op members had trouble consistently delivering the quantity and quality of produce the supermarkets demanded, a problem Mr. Chinchilla readily acknowledged.

In the case of La Fragua, Mr. Alvizures contended that the chain never gave the co-op a chance to sell the amount it was capable of. But Jorge González, the chain's manager for vegetables, said the small orders likely reflected La Fragua's judgment, based on weekly evaluations, that the co-op was not up to the task. The co-op was such a small supplier that Mr. González could not recall all the details of their dealings.

The corporate imperative is to reward suppliers who consistently provide what the chain requires. If the vegetables do not arrive, shelves stand empty. "We punish farmers very hard if they don't deliver what we order," said Bernardo Roehrs, a spokesman for the chain.

As the co-op members sought to navigate the difficult new world of supermarkets, they lost the critical guidance of Mr. López, the agronomist, when his contract expired in 2001. He is now a salesman for a company that makes high-tech greenhouses the co-op's farmers could never afford.

**A Rare Success Story**

Not too far from Palencia, in the city of Chimaltenango, is Aj Ticonel, an association of small farmers that has thrived because it has something Mr. Chinchilla's co-op lacked: a shrewd and enterprising businessman to run it.

But even for a savvy company like Aj Ticonel, success came not from supplying choosy supermarket chains but rather from its ability to exploit a global market.
Aj Ticonel sells three million pounds of mini-vegetables and snow peas for export to the United States, but only 80,000 pounds to supermarkets. Alberto Monterroso said he gave up on growing broccoli for La Fragua. He found the chain bought inconsistent amounts. "There are a lot of competitors here," he said, "a lot of small farmers trying to sell to them, so the prices are low."

The company's success has been built instead on sales of pricey vegetables for export. It now sells the same to La Fragua, and its membership has risen from 40 families in 1999 to 2,000 today.

Its plant sparkles. Its 53 packers wear gloves, face masks and hairnets as they sort slender French beans on stainless steel tables. Each box produce is marked with a bar code traceable to the family that grew it.

Aj Ticonel sold $2.5 million worth of vegetables last year, but Mr. Monterroso, a sociologist and deal maker with a passion for justice, paid himself only $18,000. Most of the company's profits are plowed back into the plant, marketing campaigns and agricultural education for the farmers.

"I want a different country for my sons," Mr. Monterroso said. "I'm trying to redistribute the wealth so people will live in harmony."

One recent afternoon, a big Aj Ticonel truck took a meandering path into the hilly countryside, stopping for peasants waiting roadside with crates of vegetables to load.

Many of them grumbled that Aj Ticonel does not pay enough and rejects too many of their vegetables, but most had been selling to the company for years. The evidence of their profit could be seen in new roofs, freshly painted homes and well-clothed children.

Still, Mr. Monterroso acknowledged how hard it will be to replicate Aj Ticonel. Three times, the company loaned money to farmers to clone itself. Three times the farmers went out of business.

For Latin America's millions of small farmers, he offered this sobering fact of life: "The client buys from us not because poor people produce it, but because it's a good product."