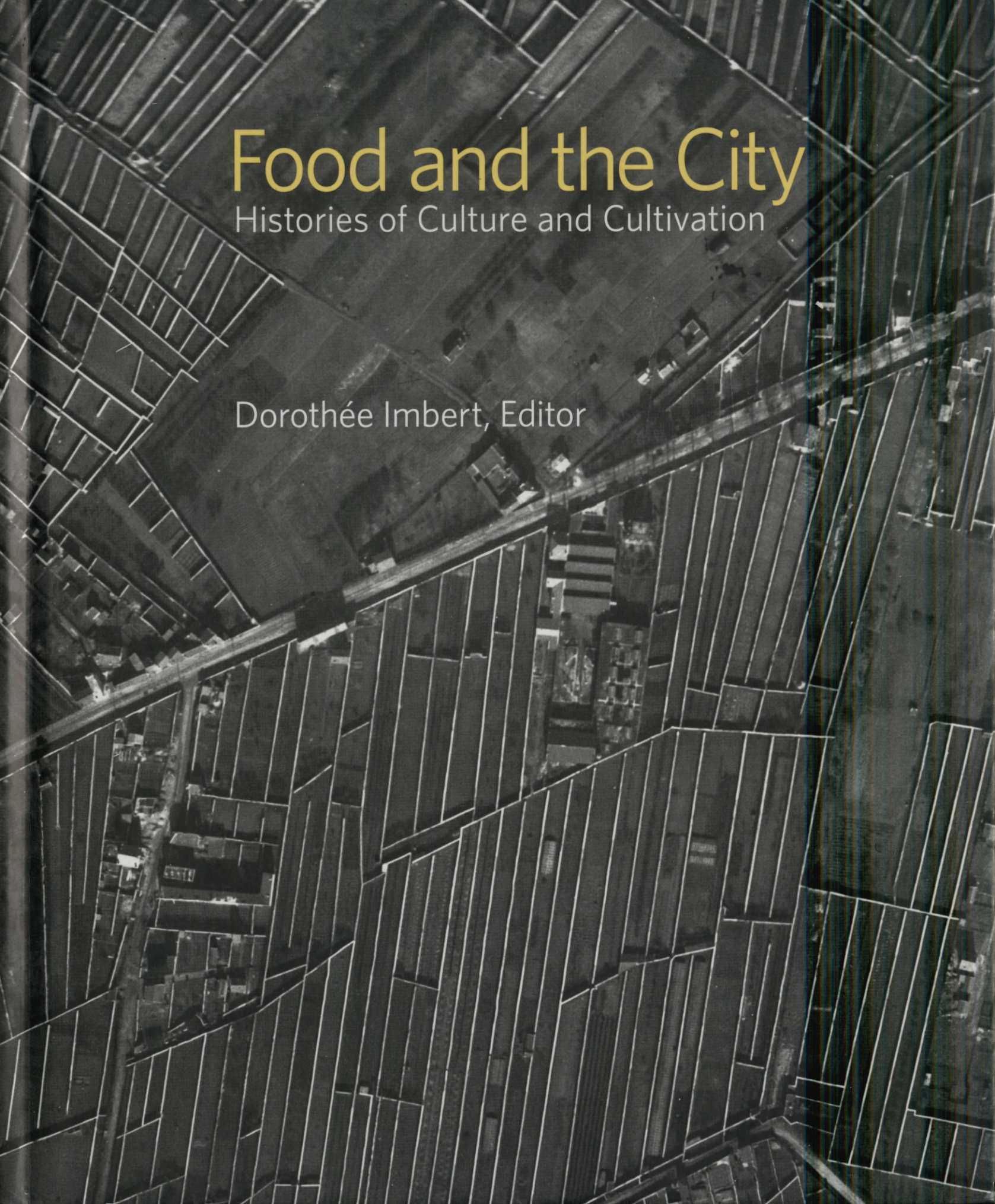

# Food and the City

## Histories of Culture and Cultivation

Dorothée Imbert, Editor

# 11

# Urban Agriculture in the Pearl River Delta

MARGARET CRAWFORD

TRAVELING THROUGH CHINA'S PEARL RIVER DELTA TODAY, THE VISitor encounters a chaotic landscape, where modern high-rise gated communities and auto dealerships abut agricultural villages, factories line once-rural roads, and new freeways pass alongside fields of subtropical fruit and fishponds. Rural migrants from all over China, here to take part in the region's economic miracle, walk from factory jobs to sleep in company dormitories or rented rooms in dense, urbanized villages. Massive construction cranes are juxtaposed with traditional Lingnan architecture. Geographers have named this condition *desakota*, an Indonesian word meaning village/town.[1] This describes a distinct spatial form of mixed urban-rural interaction increasingly found around and between major urban centers in developing countries in Asia. Desakota areas do not fit neatly into either conventional category of "urban" or "rural," but demonstrate features of both types of settlements (Figure 11.1).

The peripheral counties lying outside of Guangzhou's dense, urban core are characterized by high population densities; a rapid growth of nonagricultural activities; extreme fluidity and mobility of populations; and intensely heterogeneous land uses that mix agriculture with cottage industries, industrial estates, suburban development, and commercial activities are archetypal examples of the desakota model (Figure 11.2).[2]

Judged by its appearance alone, this desakota landscape represents a clearly visible balance between urban functions and agricultural production. Although this might be interpreted as an ideal situation where urban agriculture can flourish, in fact the opposite is true. Set in one of China's most rapidly changing regions, the future of any form of agriculture here is threatened by powerful and often contradictory economic and political forces. In order to understand how they are currently shaping the landscape, it is

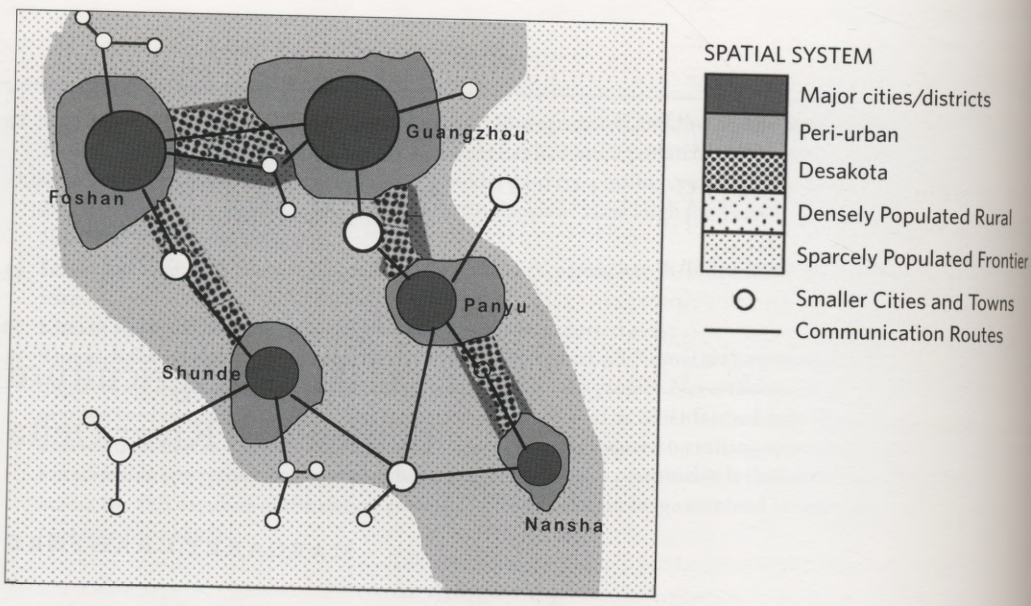


**FIGURE 11.1**

Desakota diagram of the Guangzhou metropolitan area.

Illustration by Jiong Wu.

**FIGURE 11.2**

Desakota landscapes in the Pearl River Delta.

Photographs courtesy of Panyu District Online Archive.

necessary to disassemble the pieces of this fragmented landscape. Each piece represents the physical remains of a previous incarnation. Together, they reveal a complex history marked by both radical transformation and enduring tradition. Even describing them is complicated by the fact that, although geographers propose generic desakota models, our fieldwork in Greater Guangzhou (particularly in the outlying districts of Panyu and Huadu, where city and countryside are abruptly juxtaposed) demonstrates that the articulation between urban and rural can vary widely, given the diversity and specificity of villages. With the multiple layers of the past and the contradictions of the present, predicting the future is difficult. But, given the rapidity of change and the appearance of new ideas and initiatives, it is possible to imagine, with guarded optimism, a positive outcome for urban agriculture in the Pearl River Delta.[3]

## Rice Bowl Villages

For centuries, the Pearl River Delta—the triangle between Hong Kong, Guangzhou, and Macao—was one of China's most fertile agricultural regions. Its low-lying land—crisscrossed by a maze of rivers, streams, and canals—flooded easily, giving rise to innovative irrigation and cultivation methods. Over the last few centuries, the delta's landforms changed significantly due to both natural processes, like silting, and intensive human intervention. Extensive land reclamation and the construction of dikes, canals, and ponds have been practiced here since the Ming dynasty (Figure 11.3).

During the sixteenth century, local farmers developed a system of agriculture known as the dike-pond (*jitang*) system, which integrated agriculture and aquaculture. Created in response to population growth and flooding, this unified ecosystem is based on excavating ponds and then using their soil to build dikes around them. Fish are raised in the ponds and crops grown on the dikes. Fish waste is used to fertilize the crops on the dikes and crop residues are used to feed the fish, leaving zero waste. The pinnacle of this system was reached when farmers planted mulberry trees on the dikes. Their leaves fed silkworms and silkworm waste fed the fishpond; this system flourished until the silk industry declined in the early nineteenth century.[4]

The abundant water, subtropical climate, and rich alluvial soil allowed a twelve-month growing season that produced two to three rice crops a year. Several other crops flourished, including all kinds of tropical and subtropical fruits: bananas, melons, star fruit, and oranges. The area produced most of the lychees and longans in the world. Sugarcane, peanuts, sweet potatoes, soybeans, ornamental plants, and every variety of green vegetable were important cash crops. The fish raised in ponds were the main source of protein. Until the agricultural revolutions of the mid-twentieth century, the Pearl River Delta was among the most intensive and productive agricultural regions in the world.

Such productivity gave rise to a thriving trade across the region, and by the Republican era, an extensive water-based transport system connected a hierarchy of settlements; peasants traveled by boat from their villages to sell their cash crops in market towns, which, in turn, sent goods to the metropolitan center of Guangzhou.[5]

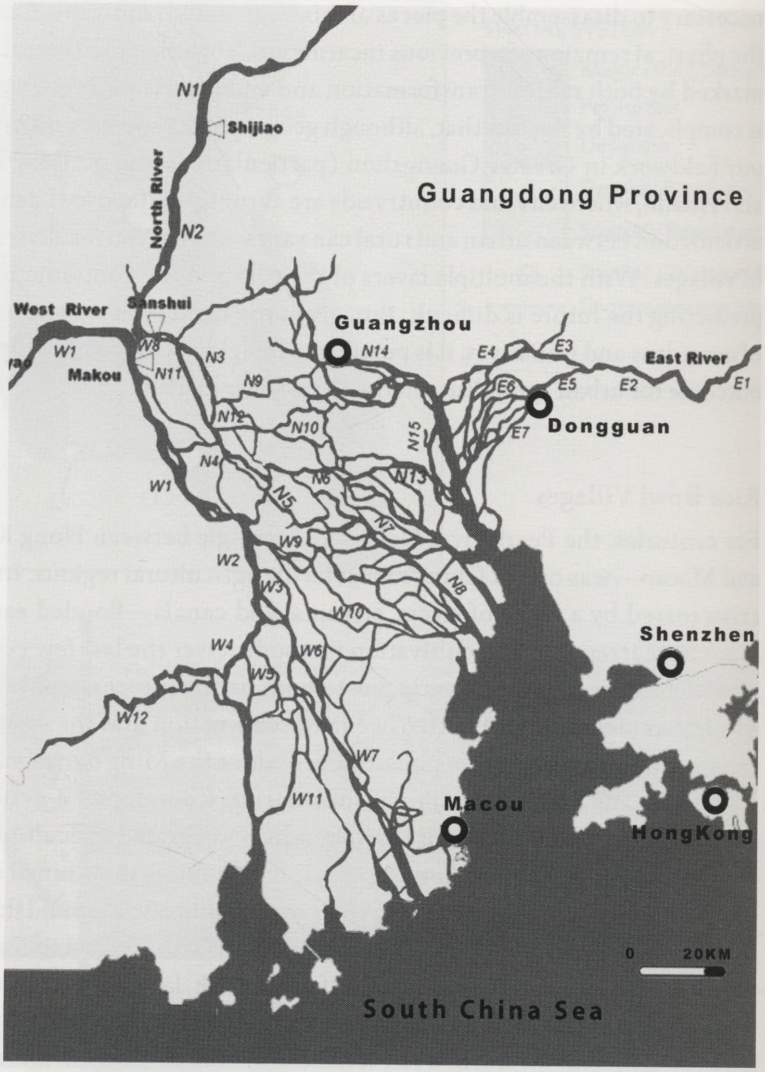


FIGURE 11.3
Water network in the Pearl River Delta.
Illustration by Jiong Wu.

Agricultural riches encouraged a dense population in villages that carpeted the delta. The agricultural village was (and remains today) the basic physical, economic, and political structure for food production in China. Over the centuries, these settlements developed unique social and spatial structures. Organized around family lineages, residents defined themselves by a single shared surname. Tracing their village's history to a common ancestor, they continuously recorded extensive genealogies in their village ancestral halls.[6] Even today, after decades of emigration, many diaspora Cantonese retain links with their ancestral village. Physically, villages followed vernacular patterns, with compact settlements, often taking distinctive forms such as comb-shapes, surrounded by their fields. Villagers followed the traditional practices of feng shui to plant trees and build ancestor halls in auspicious locations facing ponds or rivers.

This created a distinctive agricultural landscape carefully balanced between land and water. Village and agricultural values became deeply embedded in the Cantonese

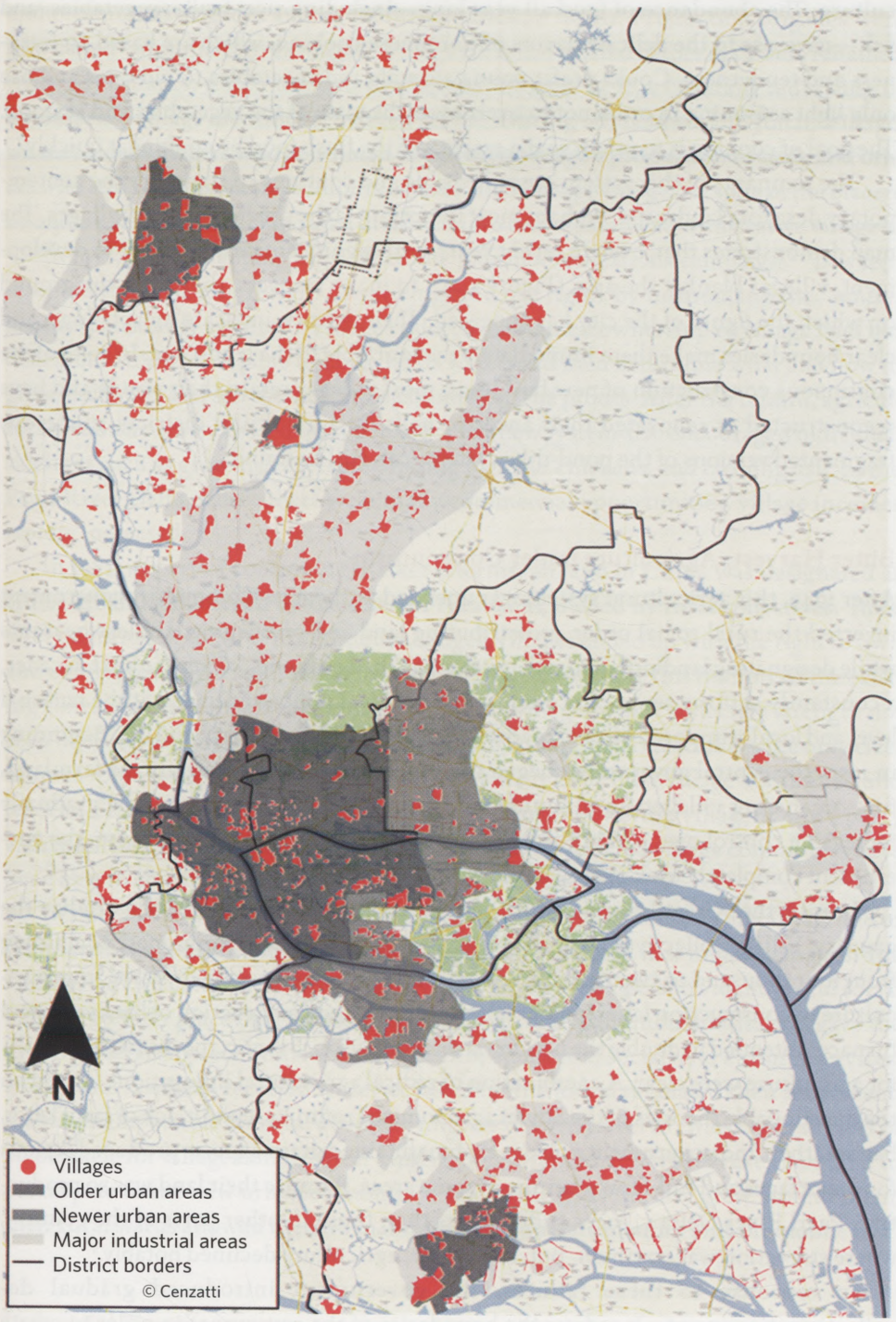


**FIGURE 11.4**

Villages in Greater Guangzhou in 2008.

Illustration by Marco Cenzatti.

culture. The abundance of food all year long—including rice, fruits, vegetables, and fish—gave rise to the delicate flavors of Cantonese cooking, which are based on freshness and tenderness. Cooks prefer young animals and vegetables to old ones and use only light seasoning in order not to overpower the taste of the vegetables and seafood. The goal of cooking is to preserve the essence of the fresh food by cooking it quickly.[7]

The remnants of this system are still visible and continue to structure the contemporary desakota landscape. Perhaps most important is the sheer density of villages. The map demonstrates that, even in recent years, with significant farmland lost to development, villages blanket the area (Figure 11.4). In many respects, they form the ground on which the figure of the city has appeared. Their density, intricate morphology, and clear boundaries make them immediately recognizable in the landscape. In spite of the continuous construction of new buildings, most villages retain their ponds and have reconstructed or renovated their ancestor halls. In agricultural districts, numerous fragmented versions of the pond-dike systems can still be found.

## Bitter Harvest: Agriculture under Communism

After 1949, this agricultural system was upended as the new Communist government inverted the rural social order, redistributing land and privileging landless peasants while designating landlords and rich peasants as "bad elements." Over the next decades, a constantly shifting series of economic and political policies, decided at the national level and locally imposed by party cadres, restructured village space and life. Beginning in 1950, the central government began the process of collectivizing village farmland, first organizing villagers into mutual-aid teams, then cooperatives, while gradually increasing control over agricultural products, methods, and tasks. After 1956, the government completely took over the market for agricultural products.[8]

In 1958, the "Great Leap Forward" mobilized peasants to rapidly industrialize the country. Village collectives were combined into huge "people's communes" containing from four thousand to twenty thousand households. Farmers were diverted from agriculture to construction labor, public works projects, and construction of backyard steel furnaces intended to double the nation's steel production. By 1960, the disastrous results for agriculture were clear. A combination of radical agricultural innovations (based on the questionable theories of the Soviet agronomist Trofim Lysenko), lack of farm labor, bad weather, and government policies that maintained grain exports produced serious food shortages and full-blown famine in some areas. Because their land was so productive, Pearl River Delta villages suffered less than those in other parts of the country, where starvation was common. But, even there, agriculture declined notably.[9]

In response to these failures, the government introduced gradual decollectivization in 1961. It redrew the boundaries of the communes in order to create smaller units, or "production brigades" (containing from two hundred to four hundred households) composed of a series of "production teams" (twenty to forty households). By encouraging modern farming methods, they managed to stabilize agricultural production. After 1978, one of Deng Xiaoping's first reforms was to dismantle the communes

and production brigades and to abolish production teams. Production brigades were now called "administrative villages." Villages that had existed before 1949 were renamed "natural" villages. Often the two overlapped. In spite of this constant redrawing of boundaries, village identities remained secure. During our fieldwork in Juitan Village, we met older villagers who continued to call their village a production brigade and others who still recognized the contours of their "Bao lineage village," in spite of the bizarre boundary that, fifty years ago, had divided it into two separate "administrative villages."

In 1978, Deng Xiaoping introduced the four modernizations campaign.[10] This represented the final step toward privatizing land use rights by introducing the "household responsibility system."[11] Village collectives retained ownership of village land but distributed individual plots to households who could then determine what and how to grow, cultivate, and sell their own crops, and keep the profits. After the reform, agricultural productivity increased by 45 percent.[12] The new system also encouraged individual sidelines such as growing vegetables, raising pigs and chickens, and farming fish. In the Pearl River Delta, where there were many commercial opportunities, village incomes rapidly increased.

In 1982, as part of continuing market reforms, all land in China was designated as either urban land, owned by the state, or rural land, owned by rural collectives. Thus, after enduring decades of tumultuous changes, villages ended up with the right to own and control their own land, at least in principle. In Guangzhou, this reinforced the existing cohesiveness of the lineage village, providing villages with a collective strength not seen in other areas of China. Finally, in the 1990s, village-level elections—the only elections in China—allowed residents to directly elect their own village committee and leaders. Elections have not necessarily resulted in empowering villagers, since party cadres still hold considerable power. But in many cases, elected village committees have been able to control and manage the village's common property.[13]

In spite of these gains, an earlier policy ensured that villagers were literally bound to their land. This was the *hukou* household registration system, first imposed in 1958. The system had two categories, "urban" and "rural," which tied a person's identity and social benefits to their place of residence. The state's drive toward industrialization gave the urban proletariat preferential access to health, education, social, and cultural services, while rural residents received far fewer benefits. The *hukou* regulated their movement, making it impossible for rural people to migrate or even travel to cities. This was less of an obstacle for village families near Guangzhou, who didn't have to leave their land to participate in the new urban economy.[14] Paradoxically, as the city grew around them, their rural status allowed them to maintain their separate identity and autonomy.

## Industrial Transformation

After 1978, one of the earliest initiatives to create a non-state economy was the creation of Township-Village Enterprises (TVEs), joint ventures between towns or villages and foreign capital. Because many villages around Guangzhou had maintained continuous ties with lineage members who had emigrated to Hong Kong and Taiwan, they easily

found investors. Attracted by low wages and trusting in their family connections, emigrant entrepreurs took the lead in establishing factories. These small enterprises, easily discernable by their blue roofs, sprouted across the countryside as villages quickly transformed less productive farmland into industrial sites. Former farmers became workers. The TVEs provided the initial impetus for the Pearl River Delta's remarkable economic dynamism, bringing capital, manufacturing knowledge, and jobs to the area. For example, in the decade between 1982 and 1992, 97 percent of Hong Kong's thousands of toy factories relocated to the Pearl River Delta.[15] But as the central government eased regulation for foreign investments, by the mid-1990s, this first wave of rural industrialization declined. The villages, no longer partners, just furnished land for factory ventures.[16]

From 1980 to 2000, the Pearl River Delta turned into south China's economic powerhouse, with an average of 16 percent yearly growth, the highest gross domestic product in China, as well as the largest percentage of foreign investment in the country. Guangzhou, a city with a relatively small core until 1978, was at the epicenter of this phenomenal growth. The population exploded and urban development spread outward as peasants from rural villages flocked to the city to find work in its booming manufacturing and construction industries.[17] In 2005, Guangzhou expanded its boundaries, swallowing up the surrounding rural counties, formerly independent townships.

Guangzhou's growth produced the final and most dramatic transformation of the village landscape. The dynamic that drove this change was the local government land acquisition process—a mechanism with the ability to convert the countryside into the town. Of the two officially designated types of land in China, one, rural land, is cheap while the other, development land, is expensive. As urbanization expands, national law allows city and county governments to appropriate village agricultural land (rural land) and change it into development land (ostensibly for the greater good), with the caveat that they must appropriately compensate the village for its land. Since the early 1980s, when land expropriation began in and around Guangzhou, local governments routinely abused this process; corruption was rampant, land was seized without due process and minimal or no compensation, force and coercion were commonplace, and illegal and unauthorized seizures were widespread. The incentive was financial rather than spatial. Because the central government distributes all tax revenue, the act of buying agricultural land cheaply and selling it to developers at much higher prices is the only way that city and county governments can generate revenue. Estimates of the percentage of municipal revenues that come from land appropriation and resale range from 40 to 74 percent.[18]

Villagers, angry at losing their farmland and demanding compensation, responded to land seizures with enormous resistance. In the Pearl River Delta, petitions, protests, confrontations with local officials, "nail houses," and demonstrations are everyday occurrences that often turn violent, with riots and attacks on government buildings and officials. Land seizures continue to be the most serious cause of social unrest all over China. One recent example dramatizes the hundreds of thousands of protests that occur every year.[19] Wukan, a village not far from the Pearl River Delta, attracted global attention at the end of 2011, when three months of protest over continuous land seizures

escalated into an outright rebellion after the village's representative died in police custody.[20] Similarly frustrated by the lack of official recourse, on July 1, 2012, hundreds of farmers from the Pearl River Delta traveled to Hong Kong to join the annual protest, held on the anniversary of the handover of Hong Kong to China, against the absence of free speech and assembly on the mainland. They carried banners denouncing the confiscation of their farmland for government-backed real estate projects.[21]

The Guangzhou municipal government has been trying to get control over this process for decades, but has only partially succeeded. One solution has been to obtain key sites by making notable concessions to the villagers, thus implicitly recognizing their claims to their land. The municipality would appropriate all of a village's land but would then give them back part of it (the amount of returned land grew over time from 5 to 12 percent). This left the village core with villagers' individual houses and a piece of "development" land that the village could rent out or develop themselves and share the profits.

Once the government had succeeded in seizing and selling village land, it left the village to its own devices, operating completely outside of the Chinese planning system. In many villages, left without farmland and surrounded by new urban development, farmers became landlords, expanding their village houses to rent rooms, apartments, and shops to the waves of migrants, rural villagers themselves, who came from all over China to find factory jobs. Villages offered the only low-cost housing in the Guangzhou, since private developers construct only luxury apartments. Individual villagers added floors to their two- or three-story vernacular houses, going way beyond the legal limit of five stories to build eight- and ten-story mini-towers on their tiny lots. Because the original village morphology remained intact, this growth produced dense clusters of flat-roofed, tiled buildings, completely different from everything else in the modernizing cityscape. In many villages, migrants vastly outnumbered the villagers. Some villagers became rich from their rents and their share of their village collective's factory leases, managed by their village committee. Often, they did not work, living off of their rental incomes. Other villages, without adequate compensation or farmland, fared badly. Young people quickly found factory employment, but their parents, former peasants, were less adaptable to new roles (see Figure 11.7).

## Agricultural Fragments

Land seizures dramatically reduced the amount of agricultural land in the Pearl River Delta, but agriculture itself did not completely vanish. It survived in two forms. One was the remnants of farmland left behind by development, and the other was the designated agricultural zone, set aside in response to the central government's policies supporting food security. Because farmland conversion typically proceeded largely in an unplanned, ad hoc fashion, urbanized villages were often left with several fields, some of considerable size. Two examples from our fieldwork on the peripheries of greater Guangzhou demonstrate the wide variety of agricultural practices taking place in these fragmented fields.


FIGURE 11.5

Longmei Village map.

Illustration by Jiong Wu, based on Google Maps.

FIGURE 11.6

Migrants farming with Longmei Village in the background.

Photograph by Nick Smith.

One example is Longmei Village in Panyu, a completely urbanized village that has become rich through its successful commercial district, gaming machines industry, and large migrant population, which outnumbers villagers five to one. Outside of its densely developed core, across the street from the new high-tech office park is a single, large parcel of land of approximately ten acres. Because the wealthy villagers, who live on the income from their shares and rents, have no interest in cultivating the land, the village committee rents parcels to migrant families (Figure 11.5). Entire families work on the land, often after a day of factory labor, raising food for their own use and often selling the excess in the village market. On neatly tilled plots they grow a wide variety of crops, some imports from their home provinces. Their intensive cultivation produces a surprising quantity of produce. In addition, there are numerous ponds, some used for fish farming, chicken and duck coops, and even pigs and other small livestock (Figure 11.6).

In Jiutan Village, on Guangzhou's northern periphery, the development of "Huadu Auto Town," a gigantic Nissan auto plant, has taken most of the village's agricultural land, leaving only a single field of one acre (Figure 11.7). Although there are many migrants living there, they do not cultivate the land. Instead, many of the villagers, usually older women, grow food on empty pieces of land, wherever they can be found, no matter how small (Figure 11.8). They locate these tiny gardens anywhere there is any


**FIGURE 11.7**
Jiutan Village map.
Illustration by Jiong Wu, based on Google Maps.


**FIGURE 11.8**
Garden typologies on appropriated land in Jiutan Village.
Photographs by Michal Kapitulnik.

spare ground—along the edges of roads, parking lots, ponds, and even the riverbank recreational bicycle path. Combined, these minute parcels equal a significant area of farmland. When we discussed agriculture with the village leaders, they sadly told us that they had lost their agricultural land, but when we asked if their wives would continue to plant vegetables, they explained proudly how they found and used land everywhere to grow outstanding produce (Figure 11.9). The growers' families consume most of their products and sell the remainder. Although the Juitan Village market is dominated by migrant women, who sell produce bought at the urban wholesale market, there are a number of village women who sell smaller quantities of food to other villagers. An older villager explained that her produce was much higher quality because she fertilizes it with urine, a traditional practice in Chinese agriculture, although it has been largely replaced by commercial fertilizers today.[22] In two very different villages, these farmland fragments, intensively cultivated, still play an important role in food provision, particularly for the poorest members of the community (Figure 11.10). Although similar fragments are widespread and form a distinctive element in Guangzhou's desakota landscape, development has also produced the need to protect agricultural land. One of China's key national policies is food security. In the Pearl River Delta, where both agricultural and industrial productivity flourish, the need for agricultural self-sufficiency continually comes into conflict with local demands for urban growth and the need to expand gross national product, another national priority.[23] Continuous development has reduced Guangdong province's food production so much that it now imports two-thirds of its food supply from other provinces.[24] To fulfill the central government's mandate for agricultural land, Guangzhou has set aside several protected agricultural areas. Like urbanizing villages, these agricultural villages are highly diverse but face similar contradictions. Xiani, on the southern tip of Panyu, illustrates some of these dilemmas (Figure 11.11).

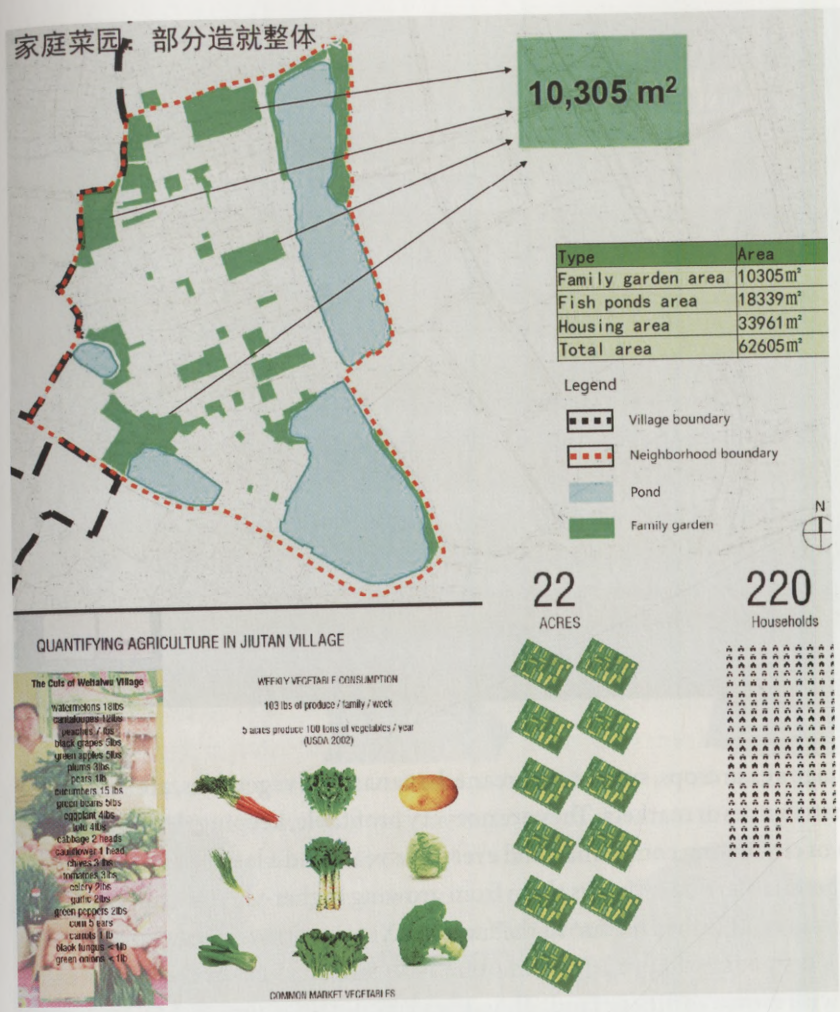


FIGURE 11.9

Family gardens in Jiutan Village.

Illustration by Michal Kapitulnik.


FIGURE 11.10

Fresh food market in Jiutan Village.

Photographs by Chris Torres and Jean Xiao.


**FIGURE 11.11**
Xiani Village
Illustration by Jiong Wu, based on Google Maps.

Xiani Village's cash crops, such as sugarcane, bananas, and vegetables, are sold either to regional distributors or markets. They are not very profitable, keeping the village poor. Their system of circulating communal land every five years and a lack of knowledge and reliance on chemical fertilizers keeps them from growing higher-yield and higher-value crops (Figure 11.12). This may be due to the fact that Xiani is not a lineage village but is inhabited by *Dan*, poor boat dwellers who, after 1949, were resettled by the government on the shore with farm and village land. Thus, they lack both the agricultural traditions and overseas connections typical of lineage villages (Figure 11.13).

Of far greater concern, however, is a problem shared by most agricultural villages: the absence of young people. Because factory work pays much better than agriculture, most of the village's younger people have left to work in nearby industrial zones in Panyu, leaving their parents and grandparents to perform the long hours of difficult agricultural labor. In a nation that, until recently, was composed primarily of peasants, farming has become culturally devalued, something to be left behind on the road to modernization. This is, in part, the result of a system that privileged the urban population, leaving rural inhabitants with low levels of education and without access to modern methods of mechanized and scientific farming.[25]

Other villages are following different paths. A number of villages in similar situations have leased their fields to Hong Kong agribusiness enterprises, which use modern industrial methods to produce high-yield crops for wholesale markets in Hong Kong and Guangzhou. Given the increased yields and economies of scale, only the most productive village agriculture can compete with them.[26] Given the income and social disparities between agricultural villages and urbanized villages, only the most lucrative


**FIGURE 11.12**

A villager explains agriculture production in Xiani Village.

Illustration by Nilay Mistry, Dorothy Tang, Andrew Watkins, and Gena Wirth.

**FIGURE 11.13**

Family gardens along the canal in Xiani Village.

Photograph by Andrew Watkins.

cash crops will induce younger villagers to continue working in the fields. Some villages have managed to do this by specializing in specific products. Many villages have replaced their fields with fishponds, which, with less manpower, can produce fresh seafood of much higher value. Other villages, with connections to urban markets, focus on the intensive cultivation of specialty crops—such as organic produce and fashionable Western imports, such as arugula, often for high-end restaurants. Recent food contamination scandals in China have resulted in increasing and justified concerns about food safety among middle-class consumers. This has created a growing market for certified and organic produce among growing numbers of consumers in Hong Kong, Shenzhen, and Guangzhou.

## Alternative Agricultural Futures

Current planning initiatives suggest that Guangzhou's desakota landscape will soon disappear. Several years ago, when I remarked on Panyu's suburban quality to Guangzhou's head planner, he told me: "there is no suburb in China, only rural becoming urban."[27] This form of urbanization appears to be the case in Guangzhou. In 2006, spurred by protests and violence over rural land appropriation, the central government introduced a major new village planning mandate. The fourth session of the 11th National People's Congress proposed guidelines for "constructing a new Socialist countryside." This formally assigned village planning to local planning bureaus and established the village as the smallest unit of Chinese planning. In Guangzhou, from 2006 to 2009, planners surveyed and created plans for all of the region's 1,100 administrative villages or 4,300 natural villages. In spite of their widely varying characters and locations—and highly diverse histories—the plans for the Socialist New Villages envision a single future for most of them. With the exception of historically and architecturally significant villages which will be preserved, the long-term goal is to eliminate existing villages and to resettle villagers in high-rise apartment towers on a portion of their village land. The municipal government will then acquire the remaining land to transform into "construction land" for urban development.[28]

In spite of these alarming plans, there is still room for some optimism. Given the sheer number of villages, the high cost of land acquisition, the complex logistics involved in "redeveloping" them, and the significant resistance that can be expected to emerge, this scenario is unlikely to play out as planned. It does, however, signal the government's intentions to acquire greater control over village land.

In the meantime, influenced by developments in Europe and the United States, a range of new proposals for urban agriculture are emerging in China, with the potential to transform this situation. On one hand, designers are attempting to upgrade the cultural meaning of agriculture, in essence "rebranding" agriculture as a culturally significant and beautiful activity. One of the best-known projects is the landscape architectural firm Turenscape's Rice Paddy Campus for Shenyang Agricultural University in Liaoning. The site for the university's new suburban campus was originally a rice field. Turenscape's design reproduced a more artful but still productive rice landscape using

rice and buckwheat as plant materials. Students tend the functioning rice paddy, which also offers campus public space. Their working rice paddies have become the university icon, with rice harvested and distributed as "Golden Rice." This landscape underscores the significance and specificity of local crops and the long growing season that characterizes this region, celebrating agricultural time and space (Figure 11.14).[29]

In Beijing, Jia Wei, a design consultant, has introduced the concept of "creative agriculture," intended to demonstrate the value of farming and make it "more rich and colorful." His firm transformed a tomato farm into the "United Nations of Tomatoes," which grows tomatoes, produces tomato-based and -themed products, and has a restaurant offering only tomato dishes. The marketing emphasizes food safety with the slogan "creative agriculture is safe agriculture." The farm has received national publicity, including a visit from Hu Jintao, and has become very profitable. According to Jia Wei, his goal is to transform the image of agriculture as well as the products.[30] His firm also developed a potato farm in Inner Mongolia, creating a potato adoption program wherein Beijing residents can adopt a plot of the farm and receive potatoes. Grown organically, the potatoes are of such high quality that they were selected to be used in food served at the Shanghai World Expo.

Other proposals and projects have tackled the economic and political complexities of translating concepts developed in the West to the realities of China. In the Minhang district of Shanghai, the RUAF Foundation (Resource Centers on Urban Agriculture and Food Security)[31] joined forces with the district government, village committees, several universities, and agricultural extension services, as well as farmers, in an effort

**FIGURE 11.14**
Turenscape, Rice Paddy Campus, Shenyang Agricultural University.
Photograph by Mary Padua.

to develop "urban agriculture with Chinese characteristics."[32] Recognizing the key role that the government plays in China, they coordinated their efforts with the local governments, spearheading an ambitious and sophisticated effort to upgrade agricultural yields and profits. They provided finance, organized villagers into cooperatives, offered intensive technical assistance, introduced niche products, and certified food safety. The result increased farmers' incomes by 20 percent and significantly reduced the gap between urban and rural incomes.

Nothing so ambitious has been attempted in the PRD, but similar ideas are being discussed. Our conversations with academics from Sun Yat-sen University, South China Agricultural University, and South China University of Technology (SCUT) reveal that they are familiar with urban agriculture practices in the West and are interested in promoting similar ideas. Minhang's success is resonant for the Pearl River Delta. SCUT Professor Cheng-yong Wang's SWOT analysis (a planning process that identifies strengths, weaknesses, opportunities, and threats) for urban agriculture in the Pearl River Delta outlines nearly identical issues. In spite of the region's diminishing farmland and high labor costs, both of which create a large income gap between urban and rural residents, the Pearl River Delta—along with its rich soil, subtropical climate, and exceptional transport system (the best in China)—has access to both domestic and overseas markets, giving it even more potential than Shanghai. Wang also recognized the currently favorable policy environment as a key opportunity, pointing out that since the 16th Party Conference, the central government has focused on improving rural circumstances and income.[33] The biggest threat, he concluded, was "thought pattern," the widespread attitude, particularly among the young, that despises agriculture.

Interestingly enough, Wang does not mention a factor that other observers regard as the region's most serious threat to food production: pollution. Studies have shown that air, water, and soil pollution in the Pearl River Delta has reached alarming levels. Rapid industrialization, lax regulations, and the use of coal-produced energy produced air pollution so severe that a brown haze hangs permanently over the area. This contains high levels of ozone, carbon dioxide, nitrogen dioxide, and suspended particulates.[34] In 2009, Greenpeace released a study documenting contamination of the Pearl River, which contains both dangerous levels of heavy metals and high levels of hazardous organic substances, from industrial waste and unprocessed sewage.[35] Both types of pollution have resulted in soil contamination with serious consequences for agriculture. In 2005, the provincial environmental protection agency found soils contaminated with heavy metals, including lead. In addition, acid rain has affected soil quality.[36] Provincial and local governments are taking measures to reverse this problem. For example, in 2008, Guangzhou announced that it would spend seven billion dollars to reduce the amount of pollution in the Pearl River. Recent measurements show that air pollution has decreased somewhat.[37] This is promising but remediation will be expensive and time-consuming, threatening an already weakened agricultural system.

Most of the discussion and efforts to support urban agriculture address farming as an occupation, focusing on improving cash crops and village incomes. This approach, crucial to the survival of the village model of agriculture, necessarily relies on top-down

methods, close cooperation with local governments, and technical expertise. The private sector has also introduced urban agriculture initiatives, primarily directed at the growing concern about food safety among affluent consumers. Outside of Guangzhou, the developer of a housing estate included a large agricultural area as a major selling point of the project. Health-conscious buyers can grow their own organic produce or, more likely, hire local farmers to do the job for them. A number of middle-class people from Guangzhou and Shenzhen have rented farmland in remote rural areas where local farmers grow organic vegetables for them.[38]

But there also needs to be room for a bottom-up approach to take advantage of the existing and widespread agricultural activity in villages. Our case studies and visits to other villages indicate that, in spite of the fact that planners, government officials, and, sometimes, even the villagers themselves do not recognize its significance and possibilities, villagers and migrants will continue to grow food in remaining fragments of village farmland. This type of urban agriculture offers many benefits, such as supplementing family diets, adding to incomes, ensuring food safety, providing specialized regional crops, educating children about nature, and offering recreation. Given the existence of village self-government and continuing rural status, urban farms could easily become a sponsored, organized, and even celebrated part of village life. One way of encouraging them would be to publicize their similarities to the American and European community and allotment gardens, which would help legitimate them in the eyes of planners and officials.

Urban agriculture of any kind is unlikely to develop significantly if the Pearl River Delta continues on a course of all-out, unchecked industrialization and urbanization. But there are numerous indications that the pace of growth in the region is slowing and that the government will have to look for alternative models of development. The 2008 global financial crises led to a sharp decline in factory orders and since then, workers' demands for higher wages and new government regulations to improve working conditions and reduce pollution have led many manufacturers to relocate to lower-wage countries, such as Vietnam or Indonesia. In 2011, expansion in the real estate sector declined notably as housing prices dropped for the first time in decades. If these trends continue, they will certainly lessen the pressure on local governments to continue converting agricultural land. All of this suggests that government officials and planners in Greater Guangzhou will have to come up with new and more sustainable forms of development. To encourage agriculture, they might look at such countries as France and regions in central and northern Italy that have successfully modernized while maintaining a strong agricultural sector and attaching a positive cultural value to farming. Urban planners and designers and landscape architects can play a major role in adding value to agricultural pursuits. Like those of Turenscape, their proposals and designs for edible landscapes and community gardens give new cultural and aesthetic meanings to the practicalities of growing food. With enough intellectual and political support, urban agriculture could be an important part of China's future.

## Notes

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11 Parish, *Chinese Rural Development*; Unter, *Transformation of Rural China*; and Anita Chan, Richard Madsen, and Jonathan Unger, *Chen Village: Revolution to Globalization* (Berkeley: University of California Press, 2009).

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15 Patricia Buckley Ebrey, *Cambridge Illustrated History of China* (New York: Cambridge University Press, 1996), 324.

16 Guldin, *What's a Peasant To Do?*, 223–58.

17 In spite of *hukou* regulations, the financial benefits outweighed the negative aspects of migration for many rural residents. During the 1990s, Guangzhou, Dongguan, and other PRD cities, recognizing the migrants' extended stays, introduced temporary work permits that legalized the migrants' presence in the region.

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