

Chapter 2

Communist Rule and the Food Security Situation

Abstract Since 1949, the Chinese Communist Party (CCP), a Leninist political organization leading a party-state, has ruled China. In this chapter we narrate the development of the planned economy in China, including agricultural growth targets, and then focus on the early choices of the regime, which influenced agricultural production: land reform and collectivization, the Great Leap Forward (1958–1960), and the Cultural Revolution (1966–1976).

After the death of Mao Zedong in 1976, and a brief succession struggle, Deng Xiaoping assumed leadership of the party and state. Deng radically changed China's economic development policy, opening the Chinese economy to competition and gradually engaging the Chinese marketplace with the world. The chapter also treats the current food system (focusing on production and use) in 2009, as well as changes in food choices in China.

Keywords Command economy • Collectivization • Communes • Great Leap Forward • Cultural Revolution • Household responsibility system • Grain reserves • “Opening to the world,” Plant foods • Animal foods • Food sufficiency • Poverty • Changes in food preferences

2.1 Establishment of the Command Economy, 1949–1978

China's new rulers did not instantly control all economic decisions upon their ascension to power. Initially, they allowed “national” capitalists, as well as middle- and rich-peasants, who had supported the revolution, to retain their assets and lands. But the Soviet Union's support for the development of party rule in China, the Sino-Soviet Alliance, and the desire of China's rulers for rapid growth led to selection of the Stalinist model of economic development.

2.1.1 Central Planning of Agricultural Production

About 80% of the population was involved in agricultural pursuits in 1949. As we note below, in the first few years after taking power, leaders disagreed on how land and production should be organized. Nevertheless, leaders shared the objective of rapidly developing China after the devastation of Japanese invasion and civil war, and the Soviet command economy model was intuitively attractive.¹

A command economy is the antithesis of the market system. In the latter, prices – signals for allocation of resources – are not set by the state or by individual or collective producers or consumers. Instead, in ideal conditions prices reflect the underlying logic of the laws of supply and demand. And in market systems, most factors of production – land, labor, and capital – are privately held. In command economies, on the other hand, the state (or party-state, in the case of communist powers) sets prices, and centralized planning bureaus and ministries determine production targets, expressed in 5-year plans. Also, in command economies, the factors of production ideally are socially-owned (owned by the state on behalf of the people).

China was at the early stage of industrialization in 1949, and for this reason, development of centralized control of industrial enterprises met few obstacles. The state was able to control the production and distribution of industrial goods through establishing state-owned enterprises (SOEs). The SOEs fell under one of four levels of government: central, provincial, municipal, or county. Enterprise directors attained their posts through the elaborate nomenclatural system dominated by the CCP, not because of their qualifications as entrepreneurs; and they held control irrespective of the performance of the factories or firms. No SOEs went bankrupt, because they had access to the deep pockets of the state. Inasmuch as the state controlled all significant enterprises, it could influence their actions. This became the objective for agricultural production. The First Five Year Plan, with a baseline date of 1952, included agricultural as well as industrial production.

2.1.2 Ideological Control of Plan Targets and Methods

Plan targets and methods were not determined by objective analysis of stages in development. Instead, Chinese leaders and pre-eminently Mao Zedong applied Marxist and Leninist ideology, based on their experience of the Chinese revolution. Mao's style of governance emphasized three elements: mass line and mass movements, class struggle and continuous revolution, and superiority of the ideologically correct to expert opinion.

Mao developed the strategy of the mass line as the primary thought instrument in struggle with the Guomindang during the civil war. After the establishment of

¹ See Edward E. Rice, *Mao's Way*. Berkeley, CA: University of California Press, 1972, 120–35.

the People's Republic in 1949, the mass line continued, reflected in large-scale movements (a campaign psychology) such as the Anti-Rightist Campaign, the Great Leap Forward, and the Cultural Revolution. From Mao's perspective, the mass line was essential in order to mobilize support from the general population and to keep communist ideology pure. Mass movements and a collectivized economy also conferred some legitimacy on the communist regime.²

From Mao's perspective, class struggle and class conflict would continue for a long period after the establishment of New China. Communist leadership needed to pay attention to the transformation from "contradictions within the people" to "contradiction with the enemies."³ Party leadership was responsible for identifying objects of struggle and launching investigation and struggle campaigns. Continuous class struggle, Mao believed, was the best way to maintain dynamism within the communist party (and avoid bureaucratic rigidity) and among the masses.

Politics commanded all economic decision-making processes during the Maoist period. Ideology set the directions and the methods for policy implementation. The centralized socialist command economy neglected local differences and reduced economic incentives, resulting in declining productivity. Those who deviated from the party line, such as intellectuals, were subject to thought reform and imprisonment.⁴

2.2 Policy Choices and Impacts on Agricultural Production

Unified in their objective to rapidly develop China, leaders of the People's Republic also learned from the experience of the Soviet Union that direct and abrupt changes to rural organization would be counter-productive. Thus, initially they moved slowly, but did so in fits-and-starts, largely determined by ideological divisions among the leadership. We treat three aspects of change in agricultural organization and in campaign strategies, which had an impact on food production as well as environmental change.

2.2.1 *Early Land Reform and Collectivization*

The communist party had engaged in land reform in areas under its control during the civil war, but at the establishment of the People's Republic, areas outside the party's orbit of power had not undergone land redistribution. An early decision was

²Stuart R. Schram, *The Political Thought of Mao Tsetung*. New York: Praeger, 1970, especially 294–330.

³*Ibid.*, 301–12.

⁴See also Brantley Womack, ed., *Contemporary Chinese Politics in Historical Perspective*. New York: Cambridge University Press, 1991; Roderick MacFarquhar, *The Politics of China: Eras from Mao to Deng*. Cambridge: Cambridge University Press, 1990; and Tony Saich, *Governance and Politics in China*. New York: Palgrave, 2001.

to reduce rents in these areas, while developing a legal basis for change, in a new land reform law, promulgated in mid-1950s.⁵ By 1952 land reform was concluded, and this campaign, which involved considerable class struggle (and liquidation of landlords), consolidated the power of the new government.

It was Mao's position that upon completion of land reform, agricultural collectivization should begin. However, Liu Xiaoqi urged a moderate policy; he sought to harness capitalistic initiatives of the peasants, thereby greatly improving agricultural productivity, before collectivization began in the near-term. Other leaders sided with Liu, and a compromise policy of forming cooperatives first, with the goal of collectivizing agriculture over a 15 year period, was adopted.⁶

Although agricultural productivity increased after land reform, the amount of grain sold to the state did not meet expectations of leaders (who were concerned, among other things, about feeding the growing urban and industrial population). Mao used this concern to bolster his ideological argument, and the regime proceeded to order collectivization of agriculture, which was accomplished by 1957–1958. By 1958, too, communes had formed, nearly autonomously, in several parts of China, and Mao then called for their spread nation-wide. Forming communes altered the distribution system and led to elimination of private plots. In the process peasants engaged in the widespread slaughter of livestock to prevent their being communized, which later led to a shortage of meat.⁷

In the period 1958–1978, the rural population was organized into three levels. At the base were the advanced producers' cooperatives (the stage reached by the end of collectivization), corresponding in size to small traditional villages and labeled "production teams." These were formed into larger units called "brigades," which in turn composed the communes – of which there were about 70,000 throughout China.⁸

In order to appropriate the agricultural surplus to invest it in industrial production, the regime established a grain monopoly, and ordered the closing of all free grain markets. Through this means, it was able to obtain and distribute the basic food supply of the nation. Essentially, party cadres told peasants what to produce and in what quantity. Also, the government regulated the agricultural tax and determined what grain was "surplus" (with the level set below consumption needs), thereby determining the price of staples. Also, by establishing a comprehensive household registration system connected to grain rations, peasants were tied to the land and to their production team.⁹

⁵Kang Chao, *Agricultural Production in Communist China: 1949–1965*. Madison, WI: The University of Wisconsin Press, 1970, 14.

⁶*Ibid.*, 17–18.

⁷*Ibid.*, 24–26.

⁸John King Fairbank and Merle Goldman, *China: A New History*, 2nd ed. Cambridge, MA: Harvard University Press, 2006, 352–53.

⁹*Ibid.*, 354, 356. Also see Jean Oi, *State and Peasant in Contemporary China: The Political Economy of Village Government*. Berkeley, CA: University of California Press, 1989.

2.2.2 *The Great Leap Forward (1958–1960)*

The stimulus for the Great Leap Forward (GLF) was the realization that grain production was barely keeping pace with population growth (of 9% in the countryside and some 30% in cities); the government's take in grain collection had not increased sufficiently to support rapid industrialization. Mao formulated another campaign, in this case to mobilize rural labor power on perhaps the largest scale in Chinese history.

Mao called his strategy “walking on two legs,” by which he meant intensive use of rural labor in both agricultural and industrial development. To develop agriculture, peasants were organized to increase reclamation of land (which in many areas increased deforestation and erosion of lands unsuitable for agriculture), to improve irrigation systems, and increase flood control efforts.¹⁰ Some of these efforts were salutary, but others – for example the campaign to eradicate the four pests – nearly eliminated sparrows, with deadly consequences for the ecological balance in rural areas.

To foster rural industrial development, with the slogan of overtaking Britain in steel production within 15 years among other goals, peasants were encouraged to construct backyard furnaces to produce steel. Nearly 100 million peasants were involved in this primitive form of steel smelting by late 1958, consuming all available iron products including pots and pans, and producing little of value.¹¹ To fuel the furnaces, peasants cut down trees where they could find them. The deforestation resulted in erosion, sedimentation, desertification, and changes of microclimates.¹²

The first year of the Great Leap campaign saw bumper crop production, but because party cadres shifted farm labor to steel production, many crops rotted in the fields. Then, over-reporting of agricultural gains increased demands on peasant communities to supply grain to the state in 1959, in a year when harvests turned poor. This led to man-made famine throughout much of rural China, and the loss of between 20 and 30 million lives to starvation and malnutrition.¹³ The colossal failure of the GLF was a testament not only to the limits of ideological direction of agricultural policy but also to the failure of command economies.

2.2.3 *The Cultural Revolution (1966–1976)*

China's Cultural Revolution (CR) was partly a reaction of Mao to the aftermath of the Great Leap Forward. At the Lushan Plenum of the CCP in 1959, Marshall Peng Dehuai criticized Mao's direction of the state, leading to Peng's purge from leadership.

¹⁰ Fairbank and Goldman, 2006, 370.

¹¹ Fairbank and Goldman, 2006, 371.

¹² See Judith Shapiro, *Mao's War Against Nature: Politics and the Environment in Revolutionary China*. Cambridge, UK: Cambridge University Press, 2001, ch. 2.

¹³ Fairbank and Goldman, 2006, 368.

Mao withdrew from active party affairs, as different leaders, notably Liu Xiaogi, Deng Xiaoping, and Chen Yun among others, sought to increase incentives for agricultural and industrial production, and return the state to normalcy.

As with many complex historical events, there were other stimuli to the CR. Mao objected to de-Stalinization in the Soviet Union and Khrushchev's leadership, as the Sino-Soviet split deepened, and as he saw similar tendencies in the CCP. He objected to what he thought was increased bureaucratic rigidity in the CCP, as well as to "capitalist roaders" (such as Liu and Deng), who seemed to have departed from communist principles. Also, he wondered how China's revolutionary spirit could be sustained, as years unfolded after the Long March without revolutionary campaigns to test the mettle of new party cadres. These ruminations occurred during the buildup of the American war in Vietnam from 1963 to 1965, when the United States seemed to press China extremely tightly.¹⁴

The CR was a time of extreme instability in China, both politically and economically. The party was internally divided, and external forces, such as the Red Guards, played major roles. (Chinese often describe the CR era today as "ten lost years" or the "lost generation," referring to opportunities lost by youth, especially in higher education.) Ultimately, the People's Liberation Army (PLA) was called on to preserve order in the state. Under these conditions, agricultural productivity did not keep pace with population growth. Threats to the Chinese environment were particularly severe during this period. We discuss three especially destructive campaigns of this era, as recounted in Judith Shapiro's *Mao's War Against Nature*.

The first example was the national campaign to "Learn from Dazhai," which was applied uncritically throughout China. The Dazhai model was artificially constructed to be an example of Mao's favorite parable of "The Foolish Old Man Who Removed the Mountain," in order to demonstrate that humans could conquer nature and bend it to their will. Among the most egregious applications of the Dazhai model were attempts to plant wheat on Mongolian grasslands, despoilation of wetlands, and encroaching on lakes and rivers to expand arable land. To purge the lakes, Shapiro notes, was to purge and rebuild the mind: "(T)he battlefield of the lake was an arena for urgent struggle: against nature, against political enemies, and against the limits of human will."¹⁵ Mao's population policy further compounded the problem.

A second example was the large movement, occurring from 1964 to 1971 and prompted by the Vietnam War, to establish a "Third Front" in the western and

¹⁴For good studies of the Cultural Revolution, see Hong Yung Lee, *The Politics of the Chinese Cultural Revolution: A Case Study*. Berkeley, CA: University of California Press, 1978; Lowell Dittmer, *Liu Shao-ch'i and the Chinese Cultural Revolution: The Politics of Mass Criticism*. Berkeley, CA: University of California Press, 1974; Anita Chan, Richard Madsen, and Jonathan Unger, *Chen Village: The Recent History of a Peasant Community in Mao's China*. Berkeley, CA: University of California Press, 1984; and William A. Joseph, Christine P. W. Wong, and David Zweig, *New Perspectives on the Cultural Revolution*. Cambridge, MA: Council on East Asian Studies, Harvard University, 1991.

¹⁵Shapiro, 2001, 129.

southwest China hinterland. The irrational distribution to this area of strategic industrial plants and facilities caused severe air, water, and soil pollution as well as deforestation.

The third example was the movement to forcibly relocate “educated youth” (called the rustification movement) to rural areas. Their reclamation work damaged wetlands and forests, destroyed the ecology of steppes, and led to desertification. Transformation of the rainforest in Yunnan province into rubber plantations denuded the soil and encouraged overhunting and deforestation. Not only were these examples of the disastrous consequences of large, poorly planned, and hurried mobilization campaigns; they also represented the adverse impacts on the environment of those (such as the lost generation of rusticated youth) who had lost their sense of place.¹⁶

In summary, for the first generation of its governing of China, the regime made several disastrous policy choices, which imperiled China’s food security and its ecological stability.

2.3 Policy Reforms, 1978–2009

Mao Zedong died in 1976, and after a short and nasty aftermath (the attempted seizure of power by the Gang of Four), Deng Xiaoping consolidated his grasp on the apparatus of state power. Until his death in 1997, Deng promoted reforms of China’s economy and social system¹⁷ (and some limited political liberalization), reforms continued by his successors. The plans for change crystallized ideas of China’s earlier reformers, including Premier Zhou Enlai shortly before his death in January 1976, to engage in long-term industrial, agricultural, military, and scientific/technological development. Called the “Four Modernizations,” the reforms unfolded gradually and often haphazardly.¹⁸ Their overall objective, however, was ambitious: to create a prosperous and powerful China by the early twenty-first century.

The initial decade of reforms focused on increasing incentives for production, especially agricultural development, increasing trade with the world, attracting foreign investment to China, and improving China’s infrastructure – all of which pertain to China’s food security. The development of environmental policy fell behind this initial reform impulse, developing only in the late 1980s, and we consider it in later chapters.

¹⁶ Shapiro, 2001, 147–53.

¹⁷ Deng’s reforms liberated the Chinese people from restrictions of classes and groups artificially created by Mao, and made them all productive members of society.

¹⁸ For an early analysis of the Four Modernizations, see Richard Baum, ed., *China’s Four Modernizations: The New Technological Revolution*. Boulder, CO: Westview Press, 1980.

2.3.1 *Introduction of Production Incentives*

Deng Xiaoping's practical orientation was reflected in statements such as "It does not matter whether the cat is white or black, so long as it catches mice," [the implication being that any person could be productive, whatever his or her class background] and "feeling for stones as one crosses the river" [meaning that Chinese should try new thinking and policies to solve old problems, in other words, be pragmatic]. His approach as China's preeminent leader was flexible, pragmatic, and non-ideological, yet he never recanted his belief in the leadership role of the CCP and that China would remain socialist (but with "Chinese characteristics").

Deng's initial reforms focused on China's rural and agrarian population, who still comprised nearly 80% of China's population in the late 1970s. The rural economy remained relatively stagnant. In the view of party cadres who worked in rural areas during the CR, conditions had not improved much since the establishment of the regime in 1949. Certainly, agricultural productivity lagged very far behind the "miracle economies" of China's capitalist neighboring states: Japan, South Korea, and Taiwan.

Thus there was general elite support for agricultural reform. First, communes were dismantled, with authority devolving to the production team (a small village or part of a village) as the primary agricultural work unit. Increasingly, however, decollectivization proceeded to the level of the household, the family farm. This soon became known as the "household responsibility system," by which was meant that the family had greater control over production decisions. Land still was owned by the state but leased on relatively long terms – as long as 30 years¹⁹ – to farmers.

Farmers gradually have been freed from the requirement that they grow cereal crops at the direction of the state. They could switch to higher-value crops, and they also were free to engage in sideline production and sell products to local markets. Farmers could not alienate the land, as they lacked complete property rights, which is a continuing issue in China's development. The land each household used also was variable; it could increase or decrease based on changes in family size as well as different estimates of land productivity. Recent surveys by Kung and Liu indicate that in the counties they studied, farmers preferred a situation of periodic reassignment of land to a situation of *de jure* land ownership.²⁰

The important point is that the rural household became the center of agricultural production. It had entered the market, as it had production contracts with the state

¹⁹ Jean Oi notes that in the case of marginal lands – barren hills, slopes, ditches and beaches – lease rights could extend to 50 years or more. See Oi, "Two Decades of Rural Reform in China: An Overview and Assessment," *China Quarterly*, 159 (September 1999), 619.

²⁰ James Kai-sing Kung and Shouying Liu, "Farmers' Preferences Regarding Ownership and Land Tenure in Post-Mao China: Unexpected Evidence from Eight Counties," *The China Journal*, No. 38 (July 1997).

including all means of production except land-use rights and access to irrigation facilities (remaining under the control of the collective). The contract also included all raw materials used in production.²¹

2.3.2 Grain Sales and Changing State Intervention

During the Maoist era, as noted above, the state exercised a monopoly on grain procurement, and it used agriculture to benefit heavy industry by paying farmers low prices for their products. After filling their quotas, farmers often had little left to sustain their families. The economic reforms in agriculture initially tolerated the opening of private markets in grain, which effectively established a dual-market in grain prices: the private, market rate, and the government rate. Yet during the first of what can be identified as six changes in purchase and distribution of staples during the 30-year reform era from 1978 to 2008,²² the system remained a state monopoly.

Then, beginning in 1984, it became difficult for the government to store all the staples it purchased (as discussed in the next section). Owing to the development of the household responsibility/contract system, farmers were motivated to produce, and there was a large scale increase in production. The inability to store all grain produced led the state to implement a contract purchase system, under which the government signed purchase agreements with farmers. The state purchased only the amount of grain specified in the contract, and remaining grain could be sold on the free market.

The third stage, beginning in 1995, was a reaction to Lester Brown's *Who Will Feed China?* that drew attention of China's leaders to food sufficiency issues and led to research by Chinese scientists on food production and consumption. In 1996, to insure food security, the State Council established a new policy to motivate farmers to grow crops. It established a price support system for staples. The price ceiling was based on the price of each central commodity during the previous 2 years. This policy was based on the assumption that, given the government's control of approximately 60% of the harvest of cereals, it would be able to control the price overall. The government sold cereals (from storage) at a slightly higher price than it purchased cereals, assuming this would avert a fiscal burden to the state. As it eventuated, this assumption proved to be incorrect.

From 1996, the production of staples increased, and the government was not able to avoid losing money when selling grains. Because of production increases, and because the remainder of the harvest was sold on the market, the officially-set price was higher than the market price, causing a drain on the central treasury.

²¹ Tony Saich, *Governance and Politics of China*, 2nd edn. New York: Palgrave, 2004, 245–46.

²² This section is based on communications from the State Grain Administration, in 2007–2008, as well as a detailed interview with grain policy experts in the Development Research Center of the State Council, May 19, 2008.

Every year, state fiscal policy allocated \$50 billion RMB (US\$7.2 billion) in subsidies, simply to pay the interest and storage fees, and to dispose of old (the previous year's) stored cereals.

The fourth stage, from 1998 to 2000, was the peak of grain production in China to that point. In order to reduce its fiscal burden, the central government decentralized the pricing of food to provincial grain bureaus. Also, it increased the quality standards of cereals it purchased, limiting state purchases to high quality goods (without defining clearly what "high" quality meant).²³ This lack of clarity led to disputes and contradictions between central and local authorities.

At the fifth stage, starting in 2000, it was clear that China did not have a food deficit and instead had surplus cereals, available for export. The net export of food in that year exceeded 20 million kilograms. Due not only to excess food production but also to environmental deterioration, the central government loosened its policy on food production. One of the tactics initiated at this time was the *Tuigeng Huanlin* or Sloping Land Conversion Program (SLCP, discussed in Chapter 3), which converted marginal agricultural land to forests or grasslands.

Simultaneously, the state increased flexibility in the structure of the agriculture system. No longer did it rigidly regulate what crops farmers could grow. They could decide themselves whether to plant cereals or other economic crops. Under these circumstances, in the 3–4 years before 2003, the production of cereals declined yearly. By 2003, cereal production had dropped to the level of 1986–1987.

It was in response to this decline in grain production that policies of the current, sixth stage, were developed. In 2004, Premier Wen Jiabao announced that the agricultural tax would be reduced annually and eliminated within 5 years. This was a highly popular proposal for farmers, and in most parts of China, the tax was completely eliminated within 3 years. Other minor, nuisance taxes on agriculture, with the exception of the tobacco tax, were eliminated as well. This reduced the burden on farmers by \$50 billion RMB (about US\$7.2 billion), and nearly 800 million farmers benefited from the changes.

Second, the state began to provide subsidies for farmers to purchase high quality seeds (in addition to other subsidies for staples production), and it provided subsidies to assist farmers purchasing capital equipment (such as farm machinery) needed to modernize their agricultural practices. The central government took funds from the crop insurance fund (with more than \$10 billion RMB [US\$1.45 billion]) to subsidize farmers in main crop production areas, and then added an additional \$7 billion RMB (US\$1.1 billion) more to insure that the system would motivate farmers.

The prices of grains are not completely set by the market in China today. In the early twenty-first century, the central government carefully monitors both the quantity and the price of food staples. To insure grain sufficiency and to provide enough grain for urban consumption, the state enters the market. The state employs three

²³ Ibid.

methods to adjust prices: (1) It uses grain reserves under its direct or indirect control to affect prices; (2) it adjusts the state purchase price (the price support) for major cereals; and (3) it provides other incentives (such as tax relief and subsidies) to encourage greater cultivation of cereals. Food price inflation (about one third of China's general price index or CPI) is watched carefully, and grain prices are paid special attention, for they comprise one third of food prices (or over 10% of the weight of CPI).²⁴ For example, when cereal prices rose in late 2006, the State Grain Administration and National Development and Reform Commission (NDRC) auctioned off 3.8 million tons of grain reserves.²⁵

As prices continued to rise due to the spike in energy as well as food costs (the CPI rose to an 11-year high of 8.7% in February 2008), the state raised the minimum purchase price of rice²⁶ and wheat. It acted first in early February, and then in late March 2008 raised state purchase prices again. NRDC officials stated their objectives were to encourage grain production and ease inflation. They added that stable food prices would curb costs for livestock farmers and related industries.²⁷ In addition, the central government again released supplies from state reserves of wheat, rice and pork, and it also increased subsidies to spur further growth of grain.²⁸ Some economists questioned whether these measures would have a long-term impact, and thought they might instead distort market-based pricing, which would discourage farmers from growing more cereals. Agricultural economist Huang Jikun argued: "China should let grain prices rise now so farmers have a greater incentive to plant more and earn more as well."²⁹ He wondered how long grain reserves would last were global inflation in food prices to continue.

²⁴ Yali Guo, "Food Prices Push Up CPI, Say Analysts," *China Daily*, May 3, 2007, 2.

²⁵ Huanxin Zhao, "Ample Food Reserves Can Feed Market Needs," *China Daily*, December 13, 2006, 1.

²⁶ Rice prices are watched particularly closely. As international rice prices doubled in early 2008, Premier Wen Jiapao said: "China has an abundant supply of rice" and had stockpiles of 40–50 million tons. See: Jize Qin and Zhiming Xin, "World Rice Price Hikes 'Will not hurt Supply,'" *China Daily*, April 1, 2008, 1. Also see: Diao Ying, "Cost of Rice 'Stable' in China," *China Daily*, April 5–6, 2008, 10; and Qiwen Liang, "Claims of Grain Shortage Dismissed," *China Daily*, April 15, 2008, 4.

²⁷ Zhiming Xin, "Nation to Raise Purchase Prices for Grains," *China Daily*, March 29–30, 2008, 10.

²⁸ For discussion of grain reserves and their use in stabilizing prices in 2007 and 2008, see these Internet materials: "Chinese State Administration of Grain Refutes Empty Granary Rumor" at http://rss.xinhuanet.com/newsc/english/2008-05/08/content_8131350.htm (retrieved May 18, 2008); "China Says It Is Able to Maintain Stable Grain Supply and Price" at http://news.xinhuanet.com/english/2008-05-06/content_8116728.htm (retrieved May 18, 2008); "Chinese Grain Reserves Sufficient" at http://news.xinhuanet.com/english/2008-05-05-content_8106686.htm (retrieved May 18, 2008); "China's State-Owned Grain Companies Shrug Off Losses" at http://news.xinhuanet.com/english/2008-02/10/content_7586454.htm (retrieved May 18, 2008); and "Time to Reform China's Grain Trade Management Regime" at <http://www.caijing.com.cn/20050404/13819.shtml> (retrieved May 18, 2008).

²⁹ Xinhua, "Importing Inflation," *China Daily*, May 19, 2008, 3.

In 2007 the China Grain Reserves Corporation (Sino Grain), controlling the bulk of the wheat crop, easily stabilized market prices for wheat.³⁰ When global prices rose for wheat, rice, and corn, and several LDCs experienced food riots,³¹ Chinese officials attempted to calm consumers and allocated additional funds to subsidize farmers' purchase of seed, diesel, fertilizer and other production costs.³² Experts in the State Grain Administration (SGA) said grain reserves were 150–200 million tons (if private reserves are included, the total rises to around 250 million tons), about 30% of annual production. Nearly 70% of reserves are rice. Overall, China's reserves are nearly double the 17% safety level set by the FAO. Yet, reflecting concerns mentioned by many agricultural policy analysts, the SGA head Nie Zhenbang referred to shrinking arable land and water shortages, saying in 2008 "We now have less room to increase grain planting acreage, and it's becoming more and more difficult to raise yields."³³

2.3.3 *Improvements in Infrastructure*

Since the onset of economic reforms, the state also has initiated comprehensive improvements in infrastructure. Given the importance of grain reserves to the control of prices, the state has invested heavily in granaries, but on at least two occasions this was insufficient to meet demand. In 1984 there was the first "granary crisis" as central state storage facilities could not hold all the cereals produced in that year.³⁴ Then, in 1990 China confronted another granary crisis. Owing to the shortage of strategic warehouses, a large amount of staples had to be stored outside, covered by reed mats. Using this method, it was possible to store grain only for one year, and there were problems of rotting of some stored foods.³⁵ From available accounts, it appears that the maximum storage capacity was reached in 1998, a peak production year, when some 512.3 million tons of grain were stored in state facilities.³⁶ As we discuss in Chapter 9, this may not be sufficient for predicted much larger harvests of the future, nor may the facilities be adequate to avoid spoilage.

³⁰ Zhiming Xin, "Bumper Summer Crop on the Cards," *China Daily*, June 18, 2007, 3. Also see, Xinhua, "Bumper Summer Harvest Expected," *China Daily*, June 17, 2008, 4.

³¹ See Keith Bradsher, "High Rice Cost Creating Fears of Unrest," *New York Times*, March 29, 2008, A5.

³² Jing Fu and Lan Wang, "Rising Prices Eating into Farmers' Income," *China Daily*, July 25, 2008, 2.

³³ Jiao Wu, "Ample Grain to Keep Food Prices Stable," *China Daily*, May 7, 2008, 1.

³⁴ Personal interview with State Grain Administration official, Beijing, May 16, 2008.

³⁵ Personal interview with grain policy expert, State Council Information office, Beijing, May 19, 2008.

³⁶ See "Chinese State Administration of Grain Refutes Empty Granary Rumor," <http://rss.xinhua-net.com/newsc/english/2008-05/08/content-8131350.htm> (retrieved May 18, 2008).

Government investments in transportation have been large and continuing. Along the eastern coast, the central government, provincial and municipal governments have invested in high-grade highways and expressways, often in association with outside investors. In the late 1980s, the state announced planned construction of the national trunk highway system (NTHS). This network of highways will, at its completion in 2010, include 12 high-capacity toll roads, five north–south highways and seven east–west highways. The network will extend 36,000 km and connect all cities with populations greater than one million.³⁷ Construction of roads in rural provinces has vastly improved transportation of products to markets. Construction and improvement of ports and harbors, particularly in the Shanghai suburban area of Pudong, has made this China's premier international economic and commercial center.

The development of special economic zones in South China, such as Shenzhen and the integration of the economies of Guangdong, Hong Kong, and Macao (in the Pearl River Delta) have made South China one of the most important regions of China. A new Beijing-Kowloon Railway also has opened up the large hinterland for South China and redirected the flow of goods and services.³⁸ (China has more than doubled the length of its railways in the reform period.)

In the late 1990s, the state launched a “Great Opening of the West” campaign to reduce disparities between this region and the much more highly developed east and south coastal provinces. Development efforts focused on Shaanxi, Gansu, Qinghai, Sichuan, Yunnan, and Guizhou provinces, the autonomous regions of Ningxia, Tibet, Inner Mongolia, Guangxi, and Xinjiang, and the newly formed municipality of Chongqing. Infrastructure improvements included roads, railways, airports, and electric power transmission facilities.³⁹

Notwithstanding these significant improvements in infrastructure, much remains to be done, particularly if China applies the principle of comparative advantage to food production and imports grains from countries which have more of an advantage in their production. For example, Li and Wang note that “In 1995, China imported 20 million tons of grain, which took about 6 months to clear from the ports, and some grain vessels had to wait in port for 2 months, causing serious economic losses.”⁴⁰

A more important need for improvement in infrastructure is to reduce the imbalance in supply of grains and demand in regional markets of China. In previous years, “transportation bottlenecks impeded the ferrying of quality rice from the

³⁷ Samuel P. S. Ho and George C. S. Lin, “Non-Agricultural Land Use in Post-Reform China,” *China Quarterly*, 179 (September 2004), 764.

³⁸ Max Lu, “Changes in China's Space Economy Since the Reform,” in Chiao-min Hsieh and Max Lu, eds., *Changing China: A Geographic Appraisal*. Boulder, CO: Westview Press, 2004, 116.

³⁹ See Elizabeth Economy, *The River Runs Black: The Environmental Challenge to China's Future*. Ithaca, NY: Cornell University Press, 2004, 210.

⁴⁰ Chenggui Li and Hongchun Wang, “China's Food Security and International Trade,” *China & World Economy* (November 4, 2002), 33.

Northeast to the South.” Rice shortages in Guangdong in 2008 prompted the Ministry of Railways to order railway authorities in northeastern provinces to improve efficiency and send 10 million tons of rice to the South within 90 days.⁴¹

2.3.4 *Opening to the World*

An important and all-encompassing reform of Deng Xiaoping was the opening of China to foreign trade, and the invitation of foreign corporations and business firms to participate in the economic development of China. The success of this policy can be seen in the impressive growth in number of foreign firms operating in China, China’s foreign trade, and foreign direct investment (FDI) in China.

Statistics tell part of this story. From 1980 to 1997, more than 160 foreign financial institutions gained government approval to develop businesses in China.⁴² Over 80% of the world’s largest 500 multinational corporations have now invested in China.⁴³ The growth in China’s foreign trade has been immense. From 1978 to 2002, China’s exports grew from about \$10 billion to \$325 billion; its imports grew from about \$11 billion to \$295 billion. Actual FDI in China during this period increased from \$916 million to more than \$52 billion, and China for most of this period drew more FDI than any other country in the world.⁴⁴ By the turn of the twenty-first century, China had become the seventh largest trading country in the world. Its foreign exchange reserves in September 2008 at their peak were \$1.9 trillion, the largest in the world.⁴⁵

When the reform era began, China was not a member of the General Agreement on Tariffs and Trade (GATT), and it needed to negotiate trade agreements individually with its major trading partners. In the case of some countries, notably the United States, this was an humiliating process for China. After the normalization of diplomatic relations with China in 1979, the USA did extend special trading preference for Chinese imports. However, trade ties were subject to annual review by the executive and the Congress. Indeed, after the Tiananmen crisis in June 1989, the Congress regularly sought linkage of the extension of most-favored nation status to improvement in China’s human rights record.

⁴¹ Xinhua, “Stabilize Grain Supply,” *China Daily*, April 30, 2008, 8.

⁴² Bian Kou, “Foreign-funded Banks Land in Chinese Market,” *Beijing Review*, December 29, 1997–January 4, 1998, 15–16.

⁴³ See Guangsheng Shi, Chinese Minister of Foreign Trade and Economic Cooperation, “Remarks at the Reception Hosted by EU-China Business Association and Belgium Chinese Economic and Commercial Council,” December 9, 2002, cited in Rex Li, “Security Challenge of an Ascendant China,” in Suisheng Zhao, ed., *Chinese Foreign Policy: Pragmatism and Strategic Behavior*. Armonk, NY: M.E. Sharpe, 2004, 38.

⁴⁴ Nicholas R. Lardy, *China in the World Economy*. Washington, DC: Institute for International Economics, 1994, 303, and Li, 2004, 38.

⁴⁵ Xinhua, “Forex Reserves Drop for First Time since 2003,” *China Daily*, December 12, 2008, 1.

From the late 1980s through the 1990s, China underwent the long negotiations process to join the global trade organization (after 1995, the World Trade Organization or WTO). China's acceptance into the WTO required changes in the nature of its economic structure, centering on trimming back the state-owned enterprises established during the command economy phase, and on increasing competitiveness throughout the economy. China's major trading partners (the USA, EU, and Japan) allowed it several years to make a smooth transition, but entrance to the WTO, finally approved by all parties in late December 2001, required the leadership to step up reform efforts, including privatization. In the case of state intervention in agriculture, WTO entry forced changes in operations of the state grain procurement bureaus. In 2003, the government announced it would end hidden subsidies for agriculture. Instead, farmers would plant based on market circumstances and receive state subsidies if the market performed poorly. The state grain procurement offices and trading companies would need to compete with private grain buyers.⁴⁶

Altogether, the economic reforms discussed above have been comprehensive, gradual, and far-reaching in their effects. Although a number of socialistic characteristics remain in the food production system, it is considerably more capitalistic in its approach, efficient and productive than in the Maoist era.

2.4 China's Current Food System

As noted in Chapter 1, a nation's food system includes the dimensions of availability, access, and utilization of food. In this section, we first consider the food products on China's tables, and then review estimates on food sufficiency. We also look at differences in food access of population groups, and then treat changes in food preferences.

2.4.1 *The Food on China's Tables*

The basis of the Chinese diet is boiled grain, and this provides most of the calories in the average diet. Reliance on plant foods is heavy, but increasingly animal foods are supplying more protein in the diet.⁴⁷

⁴⁶ Saich, 2004, 250–51.

⁴⁷ This section relies extensively on E. N. Anderson, *The Food of China*. New Haven, CT: Yale University Press, 1988, 137–81.

2.4.1.1 Plant Foods

The primary grain crop for about half to two-thirds of China's population is rice, and its major area of cultivation is southern China, where typically paddy fields are extensively irrigated. China is the world's largest producer of rice, followed by India and then Indonesia.⁴⁸ Of the several varieties of rice, the most prevalent in China are *indica*, *japonica*, and glutinous rice. In the North, dry rice is cultivated. Rice is double-cropped throughout southern China, and in some areas even triple-cropped. Yields of rice in China are among the highest in the world, but diseases, especially rice blast, influence productivity.

Among all the types of rice, paddy rice is the most important and has the largest acreage. Paddy rice was domesticated from wild rice by the BaiYue tribe in southern China. It is the main staple for people in the South. Because of its greater yield, cultivation of paddy rice gradually expanded to the North, as rice varieties developed which were more tolerant to low temperatures and improvements in irrigation systems. Recent successful cultivation of paddy rice in Heilongjiang Province (46° latitude) was heralded by the government as a major accomplishment. In China, to make better use of limited agricultural land, rice is cultivated by first raising the seedlings in a nursery. When seedlings (in a small bundle of two or three) reach 25 cm in height, they are transplanted to a prepared paddy field in a row of 20–30 m long with spacing of 10–20 cm. The field is flooded which is also an effective means to reduce weeds.

China's second most used grain crop is wheat. China also is the world's largest producer of wheat, followed by India, the USA, and Russia.⁴⁹ This crop was introduced to China from the Middle East, possibly through Xinjiang.⁵⁰ Evidence found during the Neolithic period (3,000 BC) indicates that wheat was under cultivation west of the Yellow River in what today is Gansu Province. Cultivation of wheat became common in the Qin Dynasty. Today, wheat is grown mostly in North, Central, and western China. Typically, wheat is used to produce flour, and the flour in turn is the basis for dumplings and noodles. Wheat is grown in both summer and winter.

The earliest description of maize (corn) in China was in the *Diannan Benciao* (Southern Yunnan Botanical Record), several decades prior to Columbus' voyage to the Americas. Initially, maize was cultivated in the southwestern areas of Yunnan and Sichuan, and then spread to the entire country. Large scale cultivation of corn in China began in the Qing Dynasty, as the population increased. Corn is very adaptable to different environmental conditions, and it grows well on marginal lands. Compared to other crops such as sorghum, corn is much more economical. By the nineteenth century, corn cultivation expanded to the plains of Huabei (Hebei, Henan, Shanxi, Shaanxi) and Dongbei (Liaoning, Jilin, Heilongjiang).

⁴⁸ See <http://www.fao.org/es/ess/top/commodity.html?lang=en&item27&year=2005>, retrieved March 11, 2008.

⁴⁹ See: <http://www.fao.org/es/ess/top/commodity.html?lang=en&item=15&year=2005>, retrieved March 11, 2008.

⁵⁰ Genpan Li, *China's Ancient Agriculture* (in Chinese). Taipei: Taiwan Commercial Press, 1994, 58.

Maize is now the third most important grain in China, and China is the world's second largest producer, following the USA.⁵¹ In the early twenty-first century it also is the most controversial. About 7% of corn is consumed as food – eaten directly in the central North, and in mountainous areas of the West and South, or used to make steamed bread. Most corn (about 68%) is used as animal feed. Increasingly, however, corn has become an industrial product to produce starch and ethanol,⁵² and by 2007–2008 China had become the world's third largest producer of ethanol.

The dramatic increase in use of corn to make ethanol brought about a 40% increase in corn production from 2000 to 2006. This growth responded to global demand for biofuels to meet energy shortages created by rising oil prices in 2004–2008, as well as the search for cleaner energy sources to combat global warming. Corn production earned higher profits than other staples.⁵³ Corn price increases from 2006 to 2008 fueled concerns about food price inflation. Officials blamed China's price surges on international corn market inflation, and particularly the diversion of US corn production from food to ethanol markets.

Corn constituted three fourths of the raw material producing ethanol in China, and the state had planned to increase biofuel production several fold in the next decades.⁵⁴ However, in mid-2007, the State Council responded to rising corn prices by imposing a moratorium on projects making ethanol from corn and other basic food crops. Authorities decided to phase out use of corn for ethanol, and replace it with substitutes of non-cereals such as batata, cassava, grasses, and sweet potatoes.⁵⁵ To make production of these non-cereal crops more attractive, the Ministry of Finance proposed subsidies for each hectare of non-food products that could be used to make biofuels, dependent on crude oil prices.⁵⁶

Returning to plant foods, the fourth most important are species of the millet family. Foxtail millet was used traditionally throughout northern China to make porridge. Today, the most prevalent millet species is sorghum (*gaoliang* in Chinese), and it grows well in arid areas of China. China is the world's third largest producer of millet, following India and Nigeria. It is the seventh largest producer of sorghum.⁵⁷

⁵¹ See <http://www.fao.org/es/ess/top/commodity.html?lang=en&item=56&year=2005>, retrieved March 11, 2008.

⁵² Jiao Wu, "Industrial Demand for Corn Increasing," *China Daily*, April 10, 2007, 1.

⁵³ Dingding Xin, "Corn Output Reaches Record High," *China Daily*, March 13, 2007, 2.

⁵⁴ Chuanjiao Xie, "Ethanol Output has Corn Prices Popping," *China Daily*, December 6, 2006, 1.

⁵⁵ See Xiaohua Sun, "Non-Staple Crops New Source for Ethanol," *China Daily*, June 13, 2007, 14; Tian Le, "Ban on Use of Corn for Ethanol Lauded," *China Daily*, June 22, 2007, 2; Xiaohua Sun, "Corn Won't Be Used for Biofuel in 5 Yrs." *China Daily*, July 17, 2007, 1; and Zhuoqiong Wang, "Biofuel Expert Allays Food-Shortage Worries," *China Daily*, October 12, 2007, 3. Agriculture minister Sun Zhengcai concluded this discussion by stating: "China will never develop biofuels at the cost of grain supplies or arable land." Jiao Wu, "Food Before Biofuels," *China Daily*, May 19, 2008, 3.

⁵⁶ Xinhua, "Bio-fuel Makers to Get Subsidy," *China Daily*, December 8–9, 2007, 1, 2.

⁵⁷ See <http://www.fao.org/es/ess/top/commodity.html?lang=en&item=79&year=2005> and <http://www.fao.org/es/ess/top/commodity.html?lang=en&item=83&year=2005>, retrieved March 18, 2008.

Both white and sweet potatoes are considered grains for statistical purposes in China. Although rarely are potatoes the sole staple, they are an important part of the diet locally in many parts of China. Potatoes were introduced to China at the end of the Ming Dynasty, by the Portuguese from the South (through Taiwan) and by Russians from the North.⁵⁸ By the early twenty-first century, China had become the world's largest producer of potatoes, followed by India.⁵⁹ In the judgment of experts, China cultivates fewer hectares of potatoes than optimal. The potato is vitamin-, protein-, and mineral-rich and provides most of daily nutritional requirements. Also, drought-resistant varieties grow well in the half of China's arable land lacking sufficient water.⁶⁰ However, China's potato yields are about one-third those of developed countries, largely because of the prevalence of potato diseases (as well as poor growing conditions). Other root crops, such as manioc and taro, play a less important part in the diet.

The soybean is China's best known pulse crop. High in protein, it is typically used to make fresh or dried bean curd (*doufu*), cooking oil, and soya cakes for animal food. China is the world's largest importer of soybeans. The largest producers in 2009 were Brazil, the United States, and Argentina, and increasingly South American producers have competed heavily with the USA in the China market.⁶¹ Other beans include the mung bean (called *ludou* in Chinese), peanuts, red beans, and the yam bean.

Both leafy and non-leafy vegetables (*cai*) play important parts in the Chinese diet. Leafy vegetables include cabbages, mustard greens, kale, collards, spinach, lettuce, and watercress. The most important non-leafy vegetables are root crops, such as the white radish, carrots, onions, scallions, and garlic.

Besides potatoes, other plants of the nightshade family also are important in the Chinese cuisine – for example, eggplant, tomatoes, chili and other peppers. Melons, zucchini, bitter melon, squash, pumpkins, and cucumbers are standard items of the diet too.

Fruits prevalently found on China's tables include apples, pears, peaches, plums, grapes, apricots, sweet melons, watermelons, cherries, loquat, and jujube (dates). Citrus fruits such as oranges and lemons are prevalent, as are lichi, papaya, pineapple, pomegranates, and pomelos. Nuts are a much smaller part of the Chinese diet than in other countries, but herbs and spices are essential parts of diets based on grains.

Animal Foods

Aquatic species play a larger role in Chinese diets than land animals, and a diverse set is consumed. Perhaps the most popular water species are sea cucumber and

⁵⁸ Li, 1994, 102.

⁵⁹ See Qingbin Wang and Wei Zhang, "China's Potato Industry and Potential Impacts on the Global Market," *American Journal of Potato Research*, Vol. 18 (Mar/Apr 2004), 101–09.

⁶⁰ Weifeng Liu, "Potato Could Rival Rice, Expert Says," *China Daily*, October 11, 2007, 4; and Xinhua, "Potato Seen as Viable Alternative," *China Daily*, August 15, 2007, 5.

⁶¹ See "Soybeans and Oil Crops: Market Outlook," at <http://www.ers.usda.gov/briefing/soybeansoilcrops/2008baseline.htm>; retrieved June 24, 2008.

shark fins (for the affluent), shrimp, crab, carp, groupers, pomfret, and oysters. Increasingly, aquatic species and especially fish are farmed and not taken wild from fresh or marine waters.

The primary meat animals in China historically and today are pigs and chickens. China produces half the world's pork, and it is the second largest poultry producer. The third animal species used in diets is sheep. Cattle, particularly water buffalo, were too precious as draft animals to be used as food in traditional China; moreover, Buddhists avoided beef in their diet. Today beef is gaining in popularity, but still is less important in the standard diet than pork, mutton, and chicken. Nevertheless, China ranks third in global beef production. Ducks and geese also are eaten. Dairy products have gained in popularity, as incomes have risen, and as awareness of the health benefits of milk has grown.

The Chinese diet is exceptionally varied; when food security is discussed, however, what most observers first consider is cereal crops – rice, wheat, corn, sorghum, and potatoes.

2.4.2 Degree of Food Sufficiency

Grain crops comprise about three-fourths of the total growing area and one-third of the overall value of China's agricultural output. As mentioned, rice is the most important cereal crop; it makes up roughly one-third of the area planted to cereals and between 40% and 45% of total grain production. Wheat and maize together comprise nearly one-fourth of total grain production,⁶² and as mentioned, maize production areas are increasing rapidly.

In the Maoist era as well as in the period of economic reform, self-sufficiency in grain production has been a major objective of the state. Before the early 1990s, imports of grain exceeded exports. In 2000, China was the world's ninth largest exporter of food products (\$16.38 billion or 2.9% of world exports) and the eighth largest importer (\$19.54 billion or 3.2% of world imports).⁶³ After entering the WTO, China's food exports increased by 11% and its imports rose by 22%. Yet, with imports and exports comprising less than 15% of agricultural GDP, China has a relatively low dependence on the international market. Throughout the history of the People's Republic (except in the GLF), China has been mostly self-sufficient in grain production. However, for two cereals, corn and soybeans, trade dependence is likely to increase. China's self-sufficiency in corn is expected to decline from 97.4% in 2000 to 74% in 2020. For soybeans, the ratio is expected to change from

⁶² Shaolian Liao, "Food Production in China," in Aileen S.P. Baviera, Shaolian Liao, and Clarissa V. Militante, *Food Security in China & Southeast Asia*. Manila, Philippines: Philippine-China Development Resource Center, 1999.

⁶³ Peter Oosterveer, *Global Governance of Food Production and Consumption: Issues and Challenges*. Cheltenham, UK: Edward Elgar, 2007, 3.

Table 2.1 Grain production, selected years (Adapted by authors from Shaolian Liao, “Food Production in China,” 1999, 10; and USDA, Foreign Agricultural Service, “Facts about Agriculture in China – 2005” retrieved October 11, 2006 from http://www.fas.usda.gov/remote/china_countrypage/chindex.htm; National Bureau of Statistics, *China Statistical Yearbook 2007*. Beijing: China Statistics Press, 2007, 462, and Xinhua, “Grain Trade in Deficit for Jan, Feb,” *China Daily*, April 16, 2008, 3)

Year	Grain production (million tons)
1957	200
1978	305
1984	407
1985	379
1990	446
1995	465
1997	495
2001	453
2002	457
2003	431
2004	469
2005	484
2006	497
2007	502

46.1% in 2000 to 20.6% in 2020. By that time, value of imported grains is expected to total 15% of agricultural GDP.⁶⁴ Table 2.1 presents some statistics on food production.

As we note in Chapter 3, the amount of arable land in China has declined since 1949. Food production, however, has kept pace (but in some years, just barely) with population growth. As Liao notes, China is the world’s largest grain producer and “has basically solved the issue of feeding its huge population.”⁶⁵ Indeed, China has fed its population while increasing domestic food availability, from 1,500 cal per capita per day at the start of the 1960s to 3,000 cal per capita per day at the onset of the twenty-first century.⁶⁶

Other specialists in food production issues emphasize the challenges to self-sufficiency, including insufficient agricultural investment, declining arable land, inadequate application and use of modern agricultural technology, among other factors. Of course, sufficiency depends not only on population size but the average consumption of grain. Production, in turn, varies by natural factors (natural disasters), disease and pest problems, as well as state incentives. For example, responding

⁶⁴ Jiao Wu, “Overseas Food not China’s Staple,” *China Daily*, April 26, 2007, 3.

⁶⁵ *Ibid.*, 11.

⁶⁶ Edward Anderson, “Annex 4: Food Security in China,” in Gerard J. Gill, John Farrington, Edward Anderson, Cecilia Luttrell, Tim Conway, N.C. Saxena and Rachel Slater, *Food Security and the Millennium Development Goal on Hunger in Asia*. London: Overseas Development Institute, Working Paper 231, December 2003, 1.

to the low production figures for 2003, the state made provisions for tax relief, direct payments to grain farmers, and guaranteed prices – all of which had an impact, leading to much larger productivity in 2004.

One cannot assume that grain consumption will remain constant in the future. Were per person consumption 400 kg of grain a year, with a population of 1.3 billion, total demand in 2008 would be 520 million tons. However, were Chinese to consume on average 500 kg of grain yearly, total demand would be 650 million tons. Demand for grains has increased faster than population growth. However, counteracting this is changing food preferences, discussed below. To the present, food security in China has been interpreted almost exclusively as grain security, and this may no longer be the most appropriate measurement.

2.4.3 Regional and Income Variations

Access to food depends on geographic variables (in developing nations, this particularly means distance from food producing regions) as well as income. Both factors influence access to grains in China. Part of the population, especially inhabitants of peripheral areas – Inner Mongolia, Xinjiang, Tibet, sections of Yunnan – are distant from grain processing regions. Their access depends on infrastructure, which is less well developed in these regions. Overall food costs are higher than those in China's central and eastern areas, and incomes are lower. Although state intervention in grain markets provides some uniformity of price for staples nationwide, other food costs are likely to be higher.

Where one lives in China also influences one's income-making opportunities, and food access correlates with income as well. While there are urban residents with limited access to food – and these are largely migrant workers from rural areas – the largest number of people with concerns about food costs are in China's vast rural areas. Inequality of rural and urban regions in China has greatly increased since the onset of economic reforms. Saich reports that the income gap between rural and urban areas in 1986 was 2.33:1,⁶⁷ worse than it had been at the start of economic reforms and much greater than in any period of the Maoist era. Poor people in rural areas earn low wages, and spending on food products (beyond payments available as non-cash income, if they work on farms) comprises a larger percentage of income. The rural poor frequently supplement their income by collecting wild mushrooms and wild vegetables, selling them in markets and restaurants, which often causes disturbance to the ecosystem and loss of biodiversity.

Official figures show that more than 200 million Chinese have been lifted out of absolute poverty since economic reforms began. In 1978, government statistics showed 250 million rural people living in poverty, compared to just 28 million by 2002. However, Saich points out that the government measurement of poverty was

⁶⁷ Saich, 2004, 248.

\$0.66 per day, whereas the usual World Bank standard is \$1.00 per day. By the World Bank benchmark, about 23% of rural residents, or 18.5% of the total population of China in 2002 – some 200 million – were still quite poor. Adopting the World Bank's standard of \$2.00 per day for a subsistence lifestyle, more than half, or 54% of the rural population, would be included.⁶⁸ As we note in Chapter 9, there is no consensus on the number of impoverished Chinese because of differences in definitions. The most authoritative (and recent) figure is the World Bank's: 135 million Chinese fall below the poverty line, or about 10% of the population.⁶⁹

Government programs to alleviate poverty (and thereby improve food access) include subsidized loan programs, the food-for-work program, a budgetary grant program, and in 2004 elimination of the main agricultural tax. Saich comments about the subsidized loan and food-for-work programs that "(T)he impact of these programmes on helping the poorest has not been significant and there have been serious distortions in implementation."⁷⁰

A recent study of family income uses household survey data collected by the Economics Institute of the Chinese Academy of Social Sciences (CASS). These survey data are available for 1988, 1995, and 2002, allowing a comparative analysis of poverty alleviation and income inequality in China. Authors Khan and Riskin find that from 1995 to 2002, inequality in the distribution of rural income fell almost 10% as measured by the Gini ratio (the internationally accepted measure of income inequality in national populations).⁷¹ They attribute this reduction to several factors. First, inequality among the different provinces declined and within each province, due to a reduction in regressive taxes as well as rises in farm and wage incomes. A second important factor was the decline in rural population (which peaked, at about 750 million, in 1995). Effectively, surplus rural labor migrated to urban areas in search of work. While they were less likely than urban residents to have jobs, they were no longer dragging down rural income charts.

Despite declines in rural/urban inequality rates, China's overall Gini ratio remained virtually unchanged, at 0.45,⁷² which is less than that of the most unequal countries in Latin America – Argentina (0.52), Chile (0.57), and Brazil (0.58), but above the ratio in the United States (0.41).⁷³ Khan and Riskin suggest that government policies have had some beneficial effects, particularly the "Great Western Development Strategy," programs targeted at both rural and urban poor, and restrictions

⁶⁸ Saich, 2004, 298.

⁶⁹ World Bank, *From Poor Areas to Poor People: China's Evolving Poverty Reduction Agenda*. March, 2009, iii.

⁷⁰ Saich, 2004, 300.

⁷¹ This discussion follows Azizur Rahman Khan and Carl Riskin, "China's Household Income and Its Distribution, 1995 and 2002," *China Quarterly*, 182 (June 2005), 356–84.

⁷² A 2007 report by CASS listed China's Gini coefficient at 0.496. The institute's data showed that the richest 10 percent of Chinese households owned more than 40 percent of private assets; the poorest 10 percent, on the other hand, controlled less than 1 percent. Cited in Robert Ash, "Quarterly Chronicle," *China Quarterly*, 190 (June 2007), 537.

⁷³ Khan and Riskin, 2005, 358.

on discriminatory treatment of migrant workers, but they believe that little clear progress has been made in reducing the large gap of income between rural and urban areas.⁷⁴

We return to the topic of poverty alleviation in Chapter 9. Suffice it to say here that access to food remains uneven in China today, with greater difficulties of access in rural than in urban areas.

2.4.4 Changes in Food Preferences

An extremely important change to food consumption has been the increased wealth of China's population, and the significant reduction in poverty. Chinese in 2009 have more disposable income to use on food purchases than at any time in the previous 60 years. A large middle class has grown in tandem with the rapid increase of economic development. Indeed, many newspaper stories in 2006–2009 featured the obesity problem, without emphasizing the large increase in household wealth and changes in standard of living (including consumption of fast foods) that has produced it.

Changes in food consumption patterns can be observed in the shopping behavior of Chinese, in meals cooked at home, in street stalls, even in restaurants. A sign of change is that McDonalds has about 500 restaurants in China, which usually are crowded. Foreign food shelves in supermarkets bulge with goods.⁷⁵ A recent study goes one step further by examining through survey research the food consumption pattern in Qingdao, a coastal city in Shandong Province. The study by rural sociologist Jussaume notes two overall changes in preferences.

First, consumers are less reliant on grains and more likely to increase their use of "high quality" foods, such as meat and fresh produce.⁷⁶ (In the last 30 years, per capita direct consumption of grains [by humans] has steadily declined, matched by increased grain used as feed for animals.⁷⁷) Survey respondents reported they were more likely to eat pork and chicken (but not beef) than previously. Also, they spent more of their food budget on fresh produce (and we could add, on fruit products as well). Meat products (but to a lesser extent vegetables and fruits) are income elastic, meaning that the higher one's income, the more able one is to afford them. Thus, as the population has become richer, it has shifted from the traditional diet of rice, noodles, or steamed bread, to a diet that is more varied, richer in protein, and more expensive to consume.

⁷⁴ Khan and Riskin, 2005, 383–84.

⁷⁵ Erik Nilsson, "Hunger for the West," *China Daily*, June 20, 2007, 20.

⁷⁶ Raymond A. Jussaume Jr., "Factors Associated with Modern Urban Chinese Food Consumption Patterns," *Journal of Contemporary China*, Vol. 10, no. 27 (May 2001), 229.

⁷⁷ Nuo You and Jiao Wu, "Looking Behind the Global Food Crisis," *China Daily*, July 29, 2008, 8.

Reports from other scholars of food point to increased use of dairy products, particularly milk, among middle and upper-class Chinese.⁷⁸ Too, there has been increased attention to food safety, which is represented in the appearance of “green food,” organically-grown products in marketplaces.⁷⁹

A second change is the increased preference for shopping at supermarkets and other large retail establishments. This change in food retailing practices follows the rise of market penetration by large food industry firms, such as Carrefour. Because supermarket prices tend to be higher than those of street markets (but not necessarily higher than those in smaller retail outlets), this behavior is related to income level as well.

Jussaume did not examine the preference of his respondents for western foods. When considering the motivation behind the change in food preference patterns, the most interesting association he found was between preference for meat, fresh produce, and fruits and inclination to shop at supermarkets.⁸⁰ Of course, both are income-related, which suggests that it is change in income that drives change in food preference. As Chinese economic development proceeds, and more Chinese are able to purchase “high quality” foods, we can expect that grain sufficiency alone will be even less good a measure of food security.

2.5 Conclusions

We have recounted the large changes in China’s food system since the establishment of the People’s Republic in 1949. Initially, China’s new rulers developed a command economy. They centrally determined grain production targets, and were obsessive in their desire to insure that China was self-sufficient in grain. Although leaders began agricultural change in modest steps, soon Maoist ideological goals took over planning efforts. Within a short space of years, peasant plots were collectivized and by 1958 organized into communes.

Then there followed two disastrous socioeconomic and political experiments: the Great Leap Forward (1958–1960) and the Cultural Revolution (1966–1976). The GLF exacerbated the effects of natural disasters and abrupt change in agricultural

⁷⁸ For additional information on China’s nutritional transition, see Barry M. Popkin et al., “The Nutrition Transition in China: A Cross-Sectional Analysis,” *European Journal of Clinical Nutrition*, Vol. 47 (1993), 333–46; Du et al., “A New Stage of the Nutrition Transition in China,” *Public Health Nutrition* (Vol. 5(1A) (2002), 169–74; and Vaclav Smil, “Feeding China,” *Current History*, Vol. 94, no. 593 (1995), 280–84.

⁷⁹ Observations of the authors. Also, see F. J. Simmons, *Food in China: A Cultural and Historical Inquiry*. New York: CRC Press, 1991; and Hsin-Hui Hsu, Wen S. Chen, and Fred Gale, “How Will Rising Income Affect the Structure of Demand,” in Fred Gale, ed., *China’s Food and Agriculture: Issues for the 21st Century*. Washington, DC: USDA Economic Research Service, 2002, 10–13.

⁸⁰ Jussaume, 2001, 232.

practices and organization, leading to one of the greatest famines in Chinese history and the starvation of 20–30 million people. Both the GLF and CR were serious assaults on the agricultural ecosystem, whose adverse effects continue to the present.

The death of Mao Zedong ushered in another pattern of change: Deng Xiaoping's economic reforms. Communes were dismantled and the household responsibility system created incentives that led to increased agricultural efficiency and productivity. The regime intervened somewhat less in setting agricultural prices, which had both positive and negative effects. Overall, however, production of staples kept pace with population growth. The state also invested heavily in infrastructure, and, by opening China to the world market, increased external competitive pressures on food production in China.

China's food system in 2009 is still reliant on rice, wheat, maize, and sorghum (and to a lesser extent, potatoes). In the 1990s and early twenty-first century, China has imported more agricultural products than it has exported, but is nearly self-sufficient in cereals (about 95%). Yet economic reforms beginning in the late 1970s introduced large disparities in income, both within rural and urban areas and across them. For poor Chinese, access to food in 2009 is not much better than during the 1950s and 1960s. There are fewer poor Chinese than in the 1950s, though, and a new middle class has risen. Its food preferences are different from those in traditional Chinese society, making grain security alone an unreliable indicator of food security.

In the next chapter we turn to the immediate environmental stressors on food security.

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