

Background: China's Economic Development and Implications for Agriculture

At the establishment of the People's Republic in 1949, China was still an agricultural economy in an industrializing and urbanizing world. By the late 1950s, China's leaders sought to catapult the semifeudal economy into the industrialized 20th century. Part of the plan relied on adapting Soviet-style collective agriculture to China by organizing hundreds of millions of farmers into a hierarchy of about 24,000 "Peoples Communes."¹ Except for limited cash crop production on small plots of land near individual households in some areas, all agricultural production decisions were made by local leaders in accordance with a production plan established by higher level leaders. Local leaders were obligated to deliver their quota of agricultural production to local stations run by State-owned marketing bureaus. Marketing bureaus made planned transfers of products from surplus to deficit areas at prices determined by the central Government. Agricultural prices were set low and industrial prices high to extract resources from agriculture to invest in urban and industrial development.

The Reform Period, 1978-2008

The Household Responsibility System (HRS)

When reform-minded leaders came to power in 1978, China began moving away from collective agriculture. Under a new policy, the Household Responsibility System (HRS), villages divided up collectively owned land and leased it to individual households to farm. In lieu of rent, farm households were obligated to deliver a fixed quota of their production of "strategic crops" to the State and the farm households were paid a predetermined price.² While many areas preserved elements of collective agriculture, and some villages required that certain strategic crops be produced on a portion of village land, households were largely free to farm the land as they saw fit and any production beyond the quota was theirs to consume or sell. Most importantly, farmers could produce cash crops and livestock products and sell their surpluses in rural markets. To provide opportunities for farmers to market their products, traditional rural markets were re-established throughout the countryside, and free markets were re-established in urban areas.³

Re-establishing household agricultural production autonomy and independent markets for agricultural products was the initial step in China's transition toward a market-based economy and rapid economic growth. Farmers were the first to benefit. Freed from the constraints of collective work teams and lured by high market prices, farm households shifted land and labor effort from grain production to cash crops and livestock production. Despite the shift in resources and effort, grain production rose because farmers allocated resources more efficiently than central planners. Cash crop and livestock production also boomed. Income from nonagricultural sources began to grow after reforms as rural households allocated labor to small household enterprises, expanding rural industry (known as "township and village enter-

¹ The hierarchy in the collective period was Commune-Brigade-Production Team, and these correspond roughly with today's Township-Village-Xiaozu (team).

² Strategic crops included grains, oilseeds, and cotton, but farmers were primarily obligated to deliver grain quotas, as well as quotas for cotton and oilseeds in some areas.

³ Traditional rural and urban markets were largely shut down during the collective period, except for a brief re-emergence in 1962-65.

prises” or TVEs). As urban job opportunities grew, migration to urban areas offered another alternative to farmwork.

Marketing Reform

Initial restrictions on marketing activity were eventually relaxed and inter-regional markets developed throughout the reform period. More liberal policies were intermittently reversed when they were blamed for bursts of inflation and perceived grain shortages. Once private trading networks arose, however, they were hard to rein in. By the end of the 1990s, the expansion of traders, greater marketing freedoms for private traders, and investments into transportation and communication infrastructure led to the integration of domestic markets. As marketing shifted to the private sector, Government marketing bureaus lost money because they lacked strong incentives to improve efficiency and were burdened with employment and other requirements imposed upon them, ultimately requiring Government subsidies. Many marketing bureaus were ultimately privatized and transformed into commercial agribusinesses.

Industrial Reform

By the late 1980s, China’s urban industrial economy began to blossom under reforms similar to those applied to agriculture: managers of State-owned companies were given more decisionmaking autonomy. Inefficient companies were merged with more efficient ones or shut down entirely. Moreover, the State-owned industrial sector had to compete with the more efficient rural industrial sector that rose up in the 1980s and the foreign direct-invested enterprises from the 1990s. To fuel the subsequent growth in urban and industrial areas, restrictions on labor movement were relaxed, or less vigorously enforced, so that rural workers could staff the growing ranks of industrial enterprises, urban construction projects, or take other jobs in urban areas.⁴

Trade Reform

To complement reforms to domestic production and marketing, China also liberalized trade policies to become more integrated with the world economy. Agricultural trade was long dominated by State-owned trading enterprises, monopolies for strategic products that imported and exported at the behest of State planners. For the most part, China sought to maintain self-sufficiency in agriculture, particularly for strategic products. Throughout the 1990s, however, China lowered tariffs and other trade barriers to many agricultural products. By the end of the 1990s, China had rescinded State-trading companies’ monopolies on the import and export of some strategic products, such as soybeans and cotton. In December 2001, China became a member of the World Trade Organization (WTO), which lowered tariffs further, ended the remaining State monopolies on imports and exports of agricultural products, and locked in an open trade regime along with the reformed economic policies (Lohmar, Hansen, Seeley, and Hsu, 2002).⁵

⁴ Many took jobs in the burgeoning service sector, such as in restaurants or transportation jobs, for which data are not well captured and almost certainly underestimated in official economic statistics.

⁵ Government-owned trading enterprises still wield significant influence in some crops, such as wheat and corn.

The Effect on Agriculture

China's agricultural sector is key to the country's astounding growth (Shane and Gale, 2004). Pre-1978 policies built up a reservoir of underutilized human resources in rural China with bans on labor movement and entrepreneurial activity, low farm prices, and farmer income not influenced by effort or output. In most countries, the share of population employed in agriculture plunged during the 20th century, but in China over 70 percent of workers were employed in agriculture in the late 1970s. Decollectivization released a flood of rural workers, fueling industrial growth while simultaneously boosting agricultural production to meet the food needs of a large population with rising living standards.

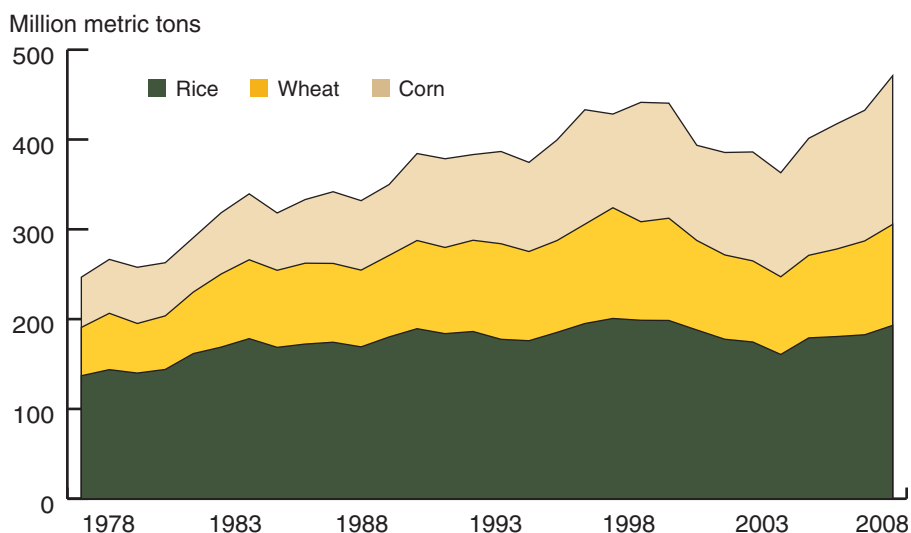
Production

China's agricultural production grew continually over the reform period despite competition for resources, particularly labor, from faster growing sectors of the economy and competition from imports as trade policies were liberalized. After reforms, grain production (rice, wheat, and corn) jumped from 247 million metric tons (mmt) in 1978 to 339 mmt in 1984 and exceeded 470 mmt in 2008 (fig. 1).⁶ Corn production grew faster than other grains to maintain exports for hard currency and to feed the growing livestock sector. Livestock production increased in the reform period, primarily for meat (mostly pork) and eggs, but in recent years, dairy production has taken off (fig. 2). For many products, China's share of world production exceeds its share of world agricultural land and, for some products, its share of world production exceeds its share of world population (fig. 3).

China's agricultural production comes almost entirely from small-scale operations. According to China's 2007 agricultural census, the country has 200 million farm households and an estimated 122 million hectares (494 million acres) of cultivated land—an average of 0.6 hectare (1.5 acres) per house-

⁶ Rice volume is reported in unmilled weight. Rice loses approximately 30 percent of its weight in the milling process.

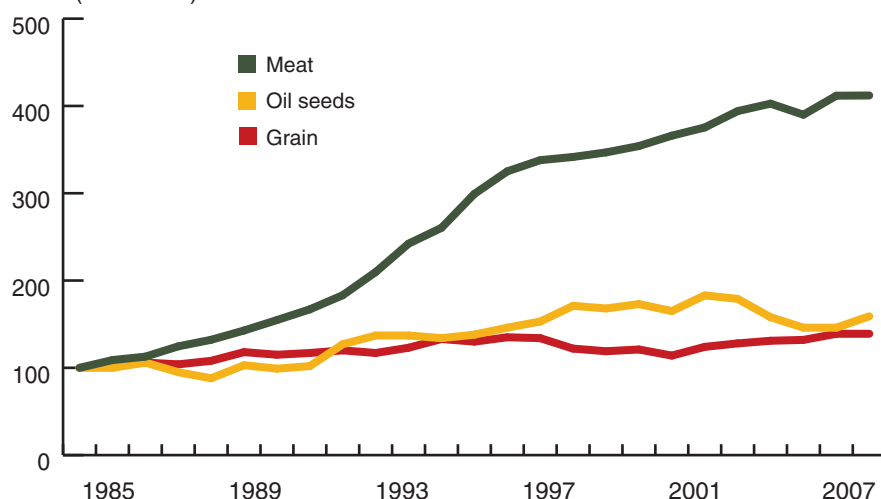
Figure 1
China's grain production increases, 1978-2008



Source: China's National Bureau of Statistics (NBS) data.

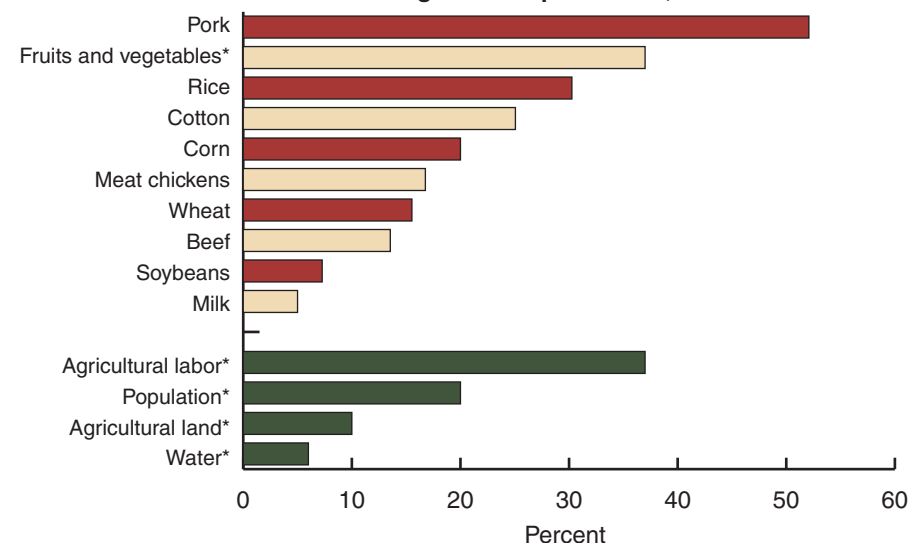
Figure 2
Indexes of grain and meat production, China, 1985-2008

Index (1985=100)



Source: China's National Bureau of Statistics (NBS) data.

Figure 3
China's estimated world shares of agricultural production, 2005

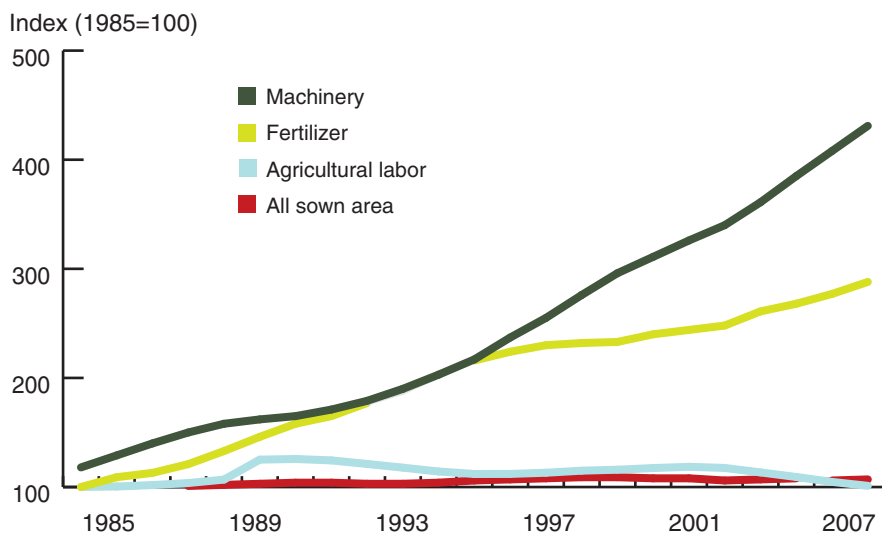


*Source: Food and Agriculture Organization data.

Source: Economic Research Service calculations based on USDA data (except where noted).

hold. These small land holdings are typically divided into several noncontiguous parcels (see, *Land* on page 14). To coax production out of such small plots, farm households engage in intensive agricultural practices, including high levels of fertilizer application and raising two or three crops per year on a single plot (fig. 4). China also relies heavily on irrigation to boost yields, with nearly 50 percent of its land supporting irrigation delivery facilities and extensive irrigation in the more arid, northern part of the country. The many crop varieties developed by China's agricultural research institutes produce high yields with irrigation and fertilizer inputs. Some varieties are bred for a short growing season to facilitate multiple-cropping.

Figure 4
Indexes of agricultural use, China, 1985-2007



Source: China's National Bureau of Statistics (NBS) data.

Markets for inputs are largely free and lightly regulated.⁷ Seeds are supplied by thousands of small seed companies that often repackage seed purchased in bulk and then sell under their own label through small seed and input supply stores located in villages and townships throughout the countryside. The pesticide industry is similarly atomized and difficult to regulate. Fertilizer is typically supplied by larger companies, but is frequently sold by private traders with shops in the county seat, rural townships, and villages or by itinerant traders who visit villages and sell from the back of their trucks. The widespread sale of counterfeit, adulterated, and poor quality farm chemicals, feeds, and veterinary drugs is a major concern for China's agricultural and commerce officials.

Marketing

State-owned marketing bureaus no longer monopolize agricultural marketing. Many of the marketing bureaus were reborn as agribusiness companies or semiofficial "industry associations." Grain marketing includes small private traders and agribusinesses, as well as local and State government-owned companies. For grains, State marketing companies compete directly with private traders, but have preferred access to Government-owned storage facilities and also are charged with purchasing grain under recently established price support programs.⁸ Market reports indicated that State-owned enterprises implementing a Government price support program accounted for 70 percent of rice purchases in late 2008. Recent surveys show that grain marketing channels vary from region to region. Many farmers prefer to sell grain to small traders who come into villages to pick up grain, saving them time and transportation costs. In some regions, large feed mills or food processors are the main purchasers.

Most horticultural and livestock products are marketed by a vast army of small traders and private marketing companies that sprang up as the production of these products grew (Huang, Otsuka, and Rozelle, 2008). Produce

⁷ Excluding factors of production, such as land and capital; efforts are currently underway to regulate the pesticide industry.

⁸ Many of the local storage facilities formerly owned by the Grain Bureau have been sold off; however, local governments are often among the new owners so that these facilities become partly Government-owned, maintaining close relations with State marketing agencies.

is typically purchased directly from farmers, often just after harvest and on the roadside, by hundreds of thousands of private traders who cruise villages and the surrounding countryside in small trucks. These traders then sell their load to larger traders or deliver it to wholesale markets where it is typically aggregated onto larger trucks for transport to faraway markets. Livestock products, particularly pork raised by farm households, are also marketed by multiple small traders, but there is also a growing contingent of large-scale farms and sophisticated agribusinesses. Small traders and brokers visit villages to buy pigs on behalf of local slaughterhouses that market most of their pork in local markets through a shrinking corps of small vendors. Supermarket chains require a more sophisticated supply chain that can guarantee refrigeration and lean pork free of banned substances. Large pork companies process frozen pork in some inland provinces, such as Sichuan, where it is then shipped to cities on China's east coast. The volume of agricultural produce going through modern marketing channels appears to be growing, but traditional supply chains operate with lower costs and recent surveys found nearly all fruits and vegetables were still marketed through traditional channels (Huang, Wu, Zhi, and Rozelle, 2008).

Consumption

As income growth elevated millions of consumers from poverty, diets improved and diversified (Lohmar, 2002; Gale, 2003; Gale and Huang, 2007). Caloric intake rose and deficiencies in vitamins and trace elements became less prevalent, but consumption of fats increased. The Chinese diet now includes fewer grain products like rice, bread, and noodles, while consumption of meats, eggs, and dairy has risen. According to figures published by China's National Bureau of Statistics (NBS), annual grain consumption by urban households fell by nearly half, from 145 kilograms (kg) per person in 1981 to 76 kg in 2006, while consumption of vegetable oils and animal protein products rose by varying amounts (table 1). The diet of China's rural population is following a similar trajectory as rising living standards spread to the countryside (Gale et al., 2005). Because rural residents' food grain consumption is so much higher than urban residents (roughly three

Table 1
Urban household annual consumption of food products, 1981-2006

Product	1981	2006	Change	
	<i>kg per person</i>		<i>kg</i>	<i>Percent</i>
Grain	145.4	75.9	-69.5	-48
Edible vegetable oil	4.8	9.4	4.6	95
Pork	16.9	20.0	3.1	18
Beef and mutton	1.7	3.8	2.1	125
Poultry	1.9	8.3	6.4	334
Fresh eggs	5.2	10.4	5.2	99
Aquatic products	7.3	12.5	5.2	71
Milk	4.1	18.3	14.2	343

Note: Table shows averages from national household surveys.

Source: Economic Research Service calculations based on China's National Bureau of Statistics (NBS) data.

times higher), urbanization is a primary driver of falling per capita food grain consumption in China.

Rising incomes and market liberalization are changing the way food is consumed in China (Gale, 2003). Meals consumed away from home are the fastest growing component of food spending (Gale and Huang, 2007). An increasing share of food is purchased in modern supermarkets, restaurants, cafeterias, and food stalls. Many urban consumers seek out quality, safety, and convenience over quantity and price. Organic food counters are now common in Chinese supermarkets, reflecting concerns about health and safety. Analysis of NBS household consumption data shows that much of the increased food spending by urban consumers reflects higher per-unit spending rather than larger quantities, an effect that is commonly attributed to preferences for quality (Gale and Huang, 2007). According to NBS data, the percent of household disposable income spent on food purchases has fallen consistently over the reform period from approximately 48 percent in 1985 to just over 26 percent in 2006.

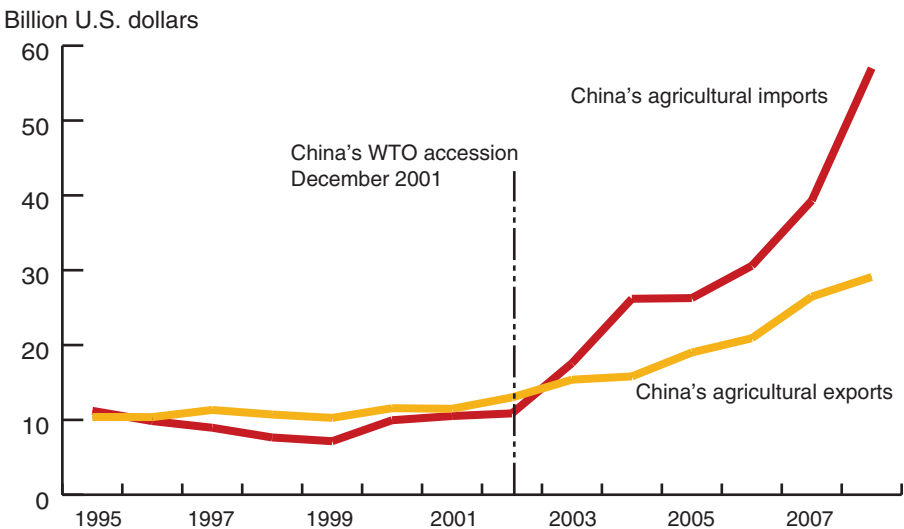
Trade

China’s agricultural imports and exports were relatively low over most of the reform period, but have risen rapidly since WTO accession.⁹ China became one of the world’s top four agricultural import countries as its agricultural imports jumped from under \$11 billion (U.S. dollars) in 2002 to over \$57 billion (U.S. dollars) in 2008. China’s agricultural exports have grown as well, but not as dramatically as imports. Agricultural exports rose from \$13 billion (U.S. dollars) in 2002 to \$29 billion (U.S. dollars) in 2008 (fig. 5). Moreover, the composition of agricultural trade has changed. Over much of the reform period, China exported corn and imported wheat, but imported only limited amounts of cotton and oilseeds.¹⁰ Today, China is largely self-sufficient in wheat, corn and rice, but it imports large amounts

⁹ Imports and exports were small relative to the size of China’s agricultural economy, but trade, both imports and exports, in specific products was at times large when compared with the world market for those products.

¹⁰ For most of the reform period, trade in all of these commodities was controlled by State trading monopolies.

Figure 5
China’s agricultural imports outpaced exports after WTO accession



Source: Economic Research Service calculations based on China customs data.

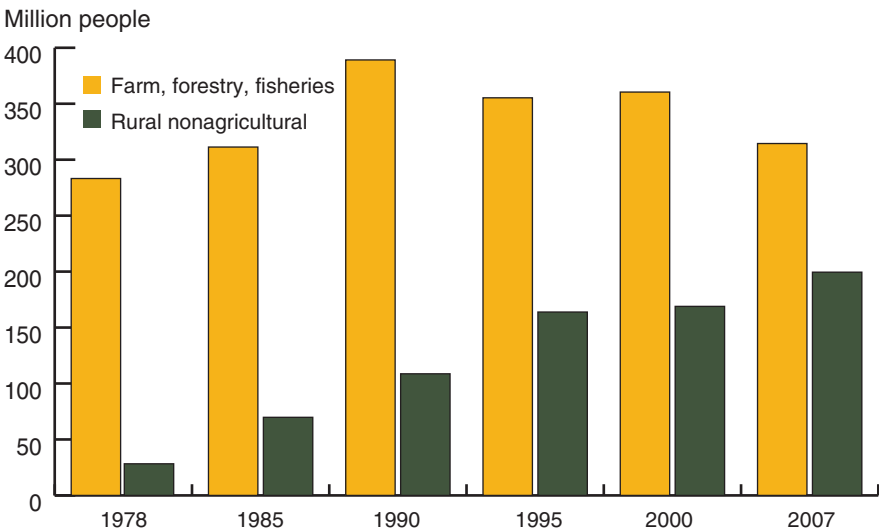
of soybeans and cotton. China has also become a major exporter of many fruit, vegetable, and livestock products, including apples, garlic, aquaculture products, poultry and pork. Since the United States is a major producer of cotton and soybeans, producers of those products have benefited greatly from trade with China. U.S. agricultural exports to China jumped from \$2 billion (U.S. dollars) before WTO accession to \$8.3 billion (U.S. dollars) in 2007. U.S. agricultural imports from China were only \$2.9 billion (U.S. dollars) in 2007.¹¹

In addition to providing low-priced food for urban and industrial workers, agriculture played a direct role in China’s rapid industrial development. Rural labor contributed heavily to the growth of the industrial, construction, and service sectors in China. Between 1978 and 2007, the number of rural workers with nonfarm employment rose from an estimated 30 million workers to over 200 million, an increase greater than the entire labor force of the United States (fig. 6).¹² By some estimates, 80 percent of rural households have some form of nonfarm employment (de Brauw et al., 2002). On average, over half of rural household income in China is from nonagricultural jobs, remittances, and investments (fig. 7). Income from nonfarm sources gives rural households funds to construct new houses, pay children’s school fees, and invest in agriculture.

The Next Stage of Reforms

China’s transformation from a closed, planned economy into a dynamic market-driven economy has been dramatic. Production and marketing reforms allow farmers more choice in their production practices, marketing venues, and income earning opportunities. This flexibility has allowed farmers to produce more staple grains while simultaneously shifting resources into livestock and horticulture production and supplying labor to the booming nonfarm economy.

Figure 6
China’s rural employment in nonagricultural sectors grows, 1978-2007

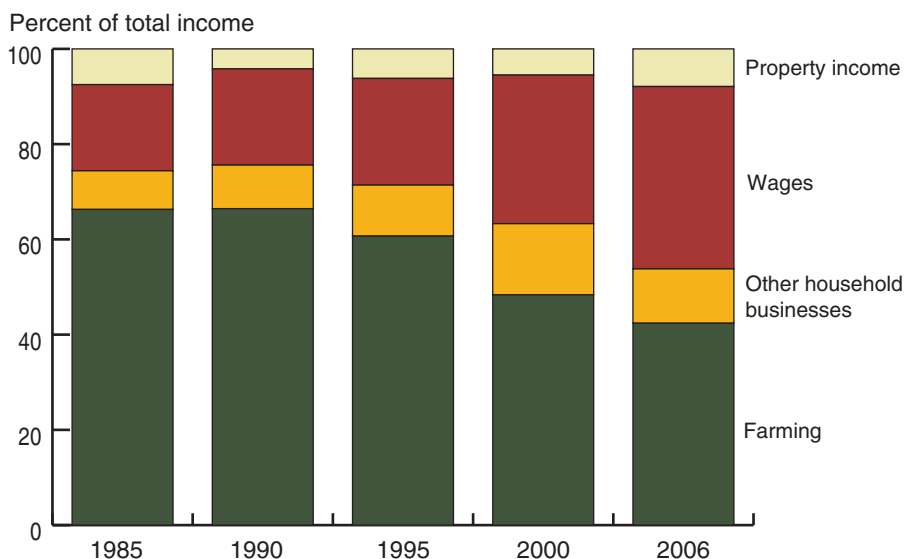


Source: Economic Research Service calculations based on National Bureau of Statistics (NBS) data.

¹¹ This figure does not include the \$2 billion (U.S. dollars) in fish and seafood imports from China or the roughly \$3 billion (U.S. dollars) in wood paneling and finished wood products, two import categories that have been rising rapidly since WTO accession.

¹² These estimates are widely believed to undercount millions of rural workers in the urban service sector.

Figure 7
China's rural household income, by category, 1985-2006



Source: Economic Research Service calculations based on China's National Bureau of Statistics (NBS) estimates of rural household "pure" (net) income.

China was able to achieve enormous production gains in the three decades after reforms, in part, because the economy produced far below its potential under central planning. Giving farmers incentives and abandoning production quotas induced farmers to work hard and produce what consumers demanded. Looser provincial self-sufficiency requirements allowed farmers to abandon crops that grew poorly in their region and specialize in products they could produce most efficiently (Carter and Lohmar, 2002). Post-1978 reforms brought forth a tremendous surge of output that showed China's production potential was greater than most observers imagined.

Three decades after reforms began, China's agricultural sector has succeeded in feeding and clothing its population, while also opening up to international markets and developing agricultural exports. But with land and water resources stretched to the limit and labor costs rising, it is unclear whether agricultural production in China can maintain its rapid growth. Future gains may require a new round of reforms that provide incentives to use land and water resources more efficiently, incentives to develop and adopt new technologies to substitute for labor or enhance the productivity of land, and incentives to increase the quality of agricultural products, including food safety. Establishing market-supporting institutions, such as clear property rights and open contract and dispute settlement mechanisms, will provide institutional support for these incentives.¹³ As land, water, and other agricultural resources increase in value, the demand for more clearly defined property rights and dispute settlement mechanisms will increase as well. Independent suppliers and farmers alike will demand dispute settlement services as they seek out assurances of quality, safety, and consistency from thousands of independent producers and input suppliers. Users of collectively or State-owned factors, such as land and water, will benefit from a more precise definition of their rights to these assets as their value increases in the rapidly growing economy. Developing a regulatory framework to

¹³ Economic historians often point to clearly defined property rights, particularly to land, and open contestable laws and courts as critical to supporting the function of markets in developed countries and helping to manage to reallocation of resources brought about by industrialization.

define property rights and resolve disputes, however, will be costly in both time and finances.

China is only just beginning to establish a more modern, market-supporting institutional framework. Recent laws help clarify rights to important resources such as land and water.¹⁴ China is also graduating more students from law schools and expanding the jurisdictional authority of the courts, while farmers are increasingly turning to courts to settle disputes over land rights (Clarke, Murrell, and Whiting, 2008).

China's path toward modernization has implications for future production, consumption, and trade. Millions of China's farm households will benefit from more secure rights to productive assets and better assurances to the quality of agricultural inputs. These changes will help farmers increase yields and reduce production costs. Increasing the integrity of marketing channels and segregating commodities to preserve quality and other attributes will allow farmers to earn premiums for higher quality and safer production practices. A variety of other policies, including rural credit and agricultural technology development and extension, will help farmers in China compete in a global marketplace. Taken together, such policies could continue the era of increased productivity, generate more and better quality food for increasingly wealthy consumers, raise rural incomes, and support China's successful integration into world agricultural markets.

¹⁴ Such as the 2002 Rural Land Contracting Law and the 2001 Water Law.

Rice fields in Guizhou Province



Photo by William Coyle, Economic Research Service.