

The China Market for Rice:

**Current Status, Recent Trends, and Projections,
with Emphasis on the Potential for Imports from
the United States and Potential for External
Competition with U.S. Rice**

A Research Study for the USA Rice Federation

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By Project Principals:

Daniel A. Sumner, Scott D. Rozelle, Jikun Huang and Hyunok Lee

Sumner and Lee Economists

740 Elmwood Dr.

Davis, CA 95616

530-756-2846

email: dasumner@ucdavis.edu

Submitted to:

Bill Farmer,

Director, Asia Program

USA Rice Federation

666 Rookin

Houston, Texas 77074

P.O. Box 740123

Houston, Texas 77274

713-270-6699 (telephone)

713-270-1146 (fax)

bill@usarice.com

Executive Summary

China is by far the largest rice producer and consumer in the world. The magnitude of the rice market in China is hard to exaggerate and the potential role of China in the global rice system is immense. Approximately one-third of all the rice in the world is produced and consumed in China. Given its size we would expect the market for rice in China to be complex. However, the absolute and relative size of the China market for rice does not fully capture the complexity. In a real sense, several markets for rice coexist simultaneously in China. These markets are differentiated by type, quality, location and customer focus. Imports and exports add further dimensions. In addition, the agricultural and food situation in China is changing rapidly, so what was true a few years ago must be reevaluated and the present situation cannot be simply projected into the future.

In the spring of 2001, the USA Rice Federation formulated a set of insightful questions around which we have organized a detailed report that considers many of the complexities related to the rice market in China. As a brief guide to the main findings of our study, this summary provides brief responses to each of the “Key Research Questions” posed by USA Rice (Which have been numbered here for convenience of reference.)

Key Research Questions:

Preliminaries

Figure 1 shows a map of China and its provinces names. A line is drawn that roughly divides the nation into two parts. Those that live north of the line prefer Japonica rice; those that live south prefer Indica rice.

Figure 2 illustrates the location of the major supply regions of China, divided into areas that only produce Japonica varieties (Pure Japonica Region—7 provinces), areas that produce both Japonica and Indica varieties (Japonica-Indica Region--3 provinces), areas that produce mostly Hybrid Indica varieties (Hybrid Indica Region—5 provinces), and areas that produce a mix of Conventional Indica and Hybrid Indica varieties (Conv-Hyb Indica Mixed Region—6 provinces).

Japonica production in China can basically be broken into 3 sub-regions (Figure 3). The area where single season Japonica is grown as a major crop (that is, production/sown area is high) includes the three northeast provinces, Heilongjiang; Jilin; and Liaoning. The area where Japonica is grown in a rice-wheat rotation includes the provinces in the Lower Yangtse Valley, Zhejiang, Shanghai, Jiangsu, and Anhui. The last region, where there are minor pockets of single season rice area, includes the North China provinces of Shandong, Hebei, and Inner Mongolia.

Indica production in China is produced with two major types of varieties—those that are hybrid varieties; and those that are conventional (non-hybrids) varieties.

Indica varieties are grown in three sub-regions (Figure 4). The first area where Hybrid Indica varieties dominate is in four provinces, Sichuan, Hubei, Guizhou, Guangxi, and Yunnan provinces. The second area where Japonica and Indica varieties are grown together is in four provinces, Anhui, Jiangsu, Zhejiang, and Shanghai. The third area where producers use both Hybrid and Conventional Indica Varieties is five provinces, Hunan, Jiangxi, Fujian, Guangdong and Hainan.

A. China Rice Imports:

1. What is the industry structure in terms of producer cooperatives, wholesalers, retailers, processors, food service organizations and government agencies? How is this evolving?

On the production side, China's rice output is almost completely supplied by more than 150 million small farmers that farm in all of China's provinces. Only 1 or 2 percent of China's rice comes from a small number of state farms, most of which are located in the Northeast. Households are the basic unit of production in China and farmers make decisions almost exclusively based on profitability considerations.

Procurement, milling, transport, wholesaling, and retailing in China are extremely competitive. Markets are increasingly integrated (Figures 5 and 6). This is seen by examining the average difference in price between pairs of markets during the late 1980s. Measured in one of two ways (middle and bottom panels in Figures 5 and 6), we can see that the difference in prices among regions is much lower in the late 1990s than when compared to the mid-1990s.

Part of the decline in price differences among markets may also be due to falling transaction costs. The transaction costs of shipping grain around the country, although still high, is falling due to investment in infrastructure and an increasingly competitive transport industry (especially in trucking). As seen in our diagrams of the physical flows of grain into the rice market in Guangzhou (Figure 7, 8, 9), Shanghai (Figure 10, 11, 12), Beijing (Figure 13, 14), and Dalian (Figure 15), by far a majority of the rice in China (in fact, around 70 percent or more) is moved around by truck. This is a big change in China's rice economy, where most rice used to be moved around by train and ship or boat. According to our interviews, the trucking industry is very competitive, and this is one of the reasons that the average price gaps between markets are falling.

In some of China's largest urban areas, there are numerous wholesale markets that compete against each other, and within each market there are scores, if not 100s, of active wholesalers that buy and sell grain through a multitude of channels. For example, there are more than 200 wholesalers in Guangzhou's 9 wholesale markets that handle rice. In one of Shanghai's largest wholesale markets (there are 6), there are more than 60 rice wholesaling firms.

On the retail side, residents have a choice of buying grain at the supermarket; in the traditional wet market, or in grain shops (Figures 7-15). The most significant change in the past several years is certainly the rise of the supermarket. In the early 1990s, the supermarket in China was a novelty and few consumers used its services. Now, for a large and rapidly growing part of the consumer population, supermarkets have become their most commonly used place for purchasing food, including rice (though in Guangzhou, the rise of rice stores and other high-end food outlets have attracted a number of consumers to shop for their rice at these specialty stores).

In almost all market venues, consumers have many choices of brands, rice types, and qualities (Table 1]). Branding is becoming common. And, consumers have lots of choice over bag size and rice quality.

Although the state is still involved in all aspects of grain marketing, they are being commercialized. These quasi-state firms have almost no power, however, since they compete against one another. Probably the most ubiquitous trends is the rise of the private sector. In summary, probably the most accurate characterization of China's rice economy in 2001 is: It is competitive and increasingly commercial-oriented and private enterprise-driven.

2. Based on historical rice production levels in China, what is the most likely demand and supply situation facing China in the near through long-term for both short/medium grain and long grain rice?

As China's economy has become wealthier and as markets (including those for commodities and rural to urban labor) have developed, two distinct sets of pressures of arisen that will affect the future, domestic demand for rice and, in turn, will help shape supply. Rising incomes have increased the demand for quality rice; rural to urban migration is shifting the consumption patterns of huge numbers of China's consumers. Because of differences in diets and taste and preferences, these pressures will affect the rice economy in north different than in the south (see our papers in the appendix on the demand for quality of rice: Huang and Rozelle, 2000; and China's marketing system: Huang and Rozelle, 1999, Economic Development and Cultural Change).

Demand in North: *Rising incomes, especially in northern cities, will increase the demand for high quality rice (though the rise in income of urban residents probably will not turn into significantly higher levels of demand—as the propensity for China's urban residents to consume more rice as incomes rise is low). The preferences for japonica varieties, an inherently higher quality of rice in China, means that there will be higher demand for japonica. The demand for japonica rice in the north will be increased by the flow of migrants from rural areas in the north who will most likely begin to mimic the dietary patterns of their new urban neighbors and increase their demand for rice (from wheat). Currently in north China, residents in rural areas consume more than 170 kilograms of wheat per capita; while urban residents consume less than half of that. Instead, urban consumers in north China eat much more rice. When migrant enter the city, one very consistent observation is that they almost immediately begin to consume foods that their urban counterparts eat. In other words, as rural wheat eaters enter the city, they almost assuredly are going to quickly adopt the habits of their new urban neighbors. To the extent that migration is expected to increase rapidly over the next several decades (by 10s of millions, if not more), there is going to be a surge in the demand for rice. They almost certainly will demand Japonica rice, too.*

Demand in South: *Rising incomes in the south will also increase the demand for high quality rice. However, in the south, this means that there will primarily be an increased demand for high quality indicas. In contrast to the north, when southern farmers move into the city, the newly arriving migrants will likely reduce their demand for rice, since they are already consuming at such high levels.*

Supply: *The impacts of these trends on trade ultimately will come down to how well China's research and extension system and producers will be able to respond*

to these emerging trends. Evidence from the past and the experience of other sectors would suggest that there will be a sharp response. China's record on raising total factor productivity (TFP) is impressive, rising more than 2 percent per year since the early 1980s (Figure 16). Output has risen as input (mostly labor) have fallen (Figure 17). During this time, as labor has fallen, farmers have increased their use of inputs at a high pace to high levels (Table 2). Examining changes in TFP by province (Table 3), the most rapid progress has come in those provinces that have been under pressure to produce more rice—e.g., Jiangsu, Anhui, Zhejiang, and the Northeast Provinces (Jilin and Heilongjiang). It should be noted that these are also the provinces that are responsible for China's Japonica production.

Since the demand-side changes are coming so quickly and occurring in such magnitude, the relevant questions are: How fast can producers respond and are there any domestic constraints that will limit the response? In the past, the research system has created a large number of new varieties; on average, there are around 25 major varieties (major means that the variety covers more than 1500 acres) grown by farmers in each province (Table 4). Moreover, farmers turn these varieties over at a very fast pace around 25 percent of the area of China's farmers are turned over each year into new varieties (Figure 18). This means that China's farmers are planting completely new varieties each four years, a level that is very high by any standard in either developing or developed countries. But this high rate of TFP growth, rapid rise of inputs, and common use of the latest technology mean that future gains may not be easy and must almost completely be based on breakthroughs in the research system. In fact, examining figures regarding the average yield gap between what farmers get in the field and what researchers attain in experimental fields we can see that the gap is small (by standards in developing countries) and getting smaller (Table 5). The gross gap was 31 percent in 1980 and only 14 percent in the mid-1990s. Since a big part of this gap is "unexploitable" (in other words is due to the facts that a.) the experiment stations have inherently better growing conditions—e.g., soil; climate; irrigation facilities—and b.) that researchers are maximizing yields and farmers are primarily worried about profits), we should expect to see the future gains in yields are all from new breakthroughs, which may or may not be forthcoming.

So far, the research system has kept up. Can it continue?

One "wild card" is the progress in yields and TFP that might be offered by new breakthroughs in China's plant biotechnology program. While little is known, we have included a brief overview of China's experience in plant biotechnology in the "Other Issues" section of the report.

3. What are the growth trends for the consumption of high-quality rice?

Rice in China, clearly, is not just rice. While no one has detailed knowledge (or an empirical basis) of the propensity of consumers to demand higher quality of rice in the future, we do know several things. First, the prices for rice over the 1990s have tends to have stayed above those for most other commodities in China's domestic market. Moreover, as far as we can tell, China's rice prices are near the world price of rice. This means that we probably will not see changes in China's prices that vary much more than those on the world market. Therefore, changes in income will drive most changes in demand. According to our study of consumers in Zhejiang (the only one to our knowledge that decomposes the demand for rice by variety), the propensity of most consumers to purchase high quality rice as incomes increase is positive and large (about a 2 to 3 percent increase in demand for a 10 percent rise in income); the propensity to consume low quality rice appears to be negative. Hence, income is the metric to watch. If China's overall economy continues to grow, there will be a continued strong surge in the demand for high quality rice in China. We know no reason why income growth should stop in the near future.

4. Who are the consumers of high-quality short/medium grain rice? Of high-quality long grain rice?

Most consumers of high-quality rice – both japonica and indica varieties – have a similar profile: they are young, well-educated, live in the larger cities, and work in high-paying professional jobs, frequently in firms associated with joint ventures or foreign owners. Those that buy high quality rice have several distinct buying habits that may lead to them consuming high-quality rice: they eat out a lot in upscale restaurants and they tend to shop in the most rapidly growing retail institution in urban China, the supermarket. In south China (especially in the Pearl River Delta in Guangdong province), a number of specialty rice shops have appeared in the richest neighborhoods, shops that are frequented by non-working spouses and maids/cooks of upper-middle households.

In rural areas, especially in areas in the Yangtse River Valley, it is the richer households that consume higher amounts of Japonica Rice, which in this area is the higher quality rice. In other words, higher income in rural areas lead to higher demand for higher qualities of rice (Table 6).

5. What price premium does high-quality rice command over “regular” varieties?

Consumers at the very high end will pay up to twice to three times as much for the highest quality of rice. While regular consumers are paying 2 to 3 yuan/kg, the young elite within the economy and executives from Hong Kong and Taiwan and Southeast Asia will pay over 10 yuan/kg. But this segment of the market is small and will likely grow relatively slowly (like that for high-end luxury cars). There is a larger and more rapidly growing segment of the market that will pay a fairly high premium for good rice in convenient packaging form that will pay up to 50 percent more. For example, in Beijing, while most consumers will buy japonica in bulk or in larger bags from the south (Lower Yangtse Valley) or from parts of the Northeast for 3 yuan/kg, there is a growing cohort of individuals who will pay up to 5 yuan/kg or more for high quality, specialty japonicas from certain areas of the Beijing or Tianjin suburbs or from parts of Heilongjiang – rices that are increasingly being branded and put into more attractive and smaller packages.

6. What are the major brands and respective market shares?

Brands only play a role—though an increasingly important one—in supermarkets, one of the three most important retail outlets. There is almost never branding in wet markets or in small grain/food shops (except for in some of the emerging super-specialty rice shops in Guangdong). However, although branding is becoming popular in the rapidly expanding supermarket segment of the food retail market, there are a large and increasing number of brands. Brands tend to still be local, but it is possible to find some brands are emerging nationally. In some cases, a single brand will use rice from various localities, but will clearly mark on the package where the rice is from. Chinese consumers will look at the origin of rice in their rice purchasing decision.

As can be seen from our survey on brands and prices and packaging in supermarkets in Beijing, Shanghai, and Dalian, there is a considerable choice that is emerging for consumers (Table 1). Packages come in a variety of sizes. Prices give consumers a choice of quality. Also, it is interesting that there are brands forming that market rice from different regions under the same name, but differentiate the rice by source of rice (rows 9 to 10). The price in some areas is substantially higher (e.g, Tianjin) because it is known for its high quality.

7. What are the current wholesale and retail prices of imported and domestic rice, both long grain and short/medium grain?

Before discussing quality, we will take a short digression and discuss the price of China's rice and provide a comparison to rice prices in the US. In short, although it is very hard to compare, it appears as if – at least in 2001 – the price of rice in China's main centers of production (Dalian) and in California (Sacramento) are very similar. In mid-August 2001, according to the government's price reporting service, the price of rice (medium grain, no. 1, 4 percent broken) in Sacramento was \$US243/ton (August 13th Rice Outlook Report from the USDA); according to our interviews, the price (on medium grade Japonica) in the wholesale market in Dalian during the first week of August 2001 was between \$US241 to \$US264. To compare China's rice price, which are usually report in Chinese yuan per kilogram, one needs to convert currency. In this report we use the formal exchange rate: 1 US dollar equals 8.3 Chinese yuan (which has been the exchange rate for the past 9 years). Using this exchange rate, if China's price is 2 yuan per kilogram, the price in US dollars per ton is 240.96.

China, of course, has many different qualities in different segments of its markets. It exports Indica rice that can compete with the exports from Vietnam and Thailand. For example, the 1999/2000 year average price of rice for Thailand's 100%, grade B long grain rice in Bangkok was \$US172/ton; the price for Vietnam's 35% broken in Hochimin City was \$US145/ton; China's average domestic wholesale price for Indica rice during this time period ranged between \$US165/ton to \$US200/ton.

Its exported its brown rice to South Korea in 2000 for \$US250/ton (this was in paddy price, although they exported brown rice).

In 2000, they imported very high quality Thai Jasmine in paddy terms, landed in the port of Guangzhou, at an average price of \$US399.99/ton.

With this understanding, we can now discuss some aspects of rice prices in terms of China's pricing standards.

Domestic rice: *In early August, the wholesale price of Japonica rice in Dalian was 2.00 to 2.40 yuan/kg [this is between US\$ 241 to 264/ton—versus about \$US243/ton for no. 1, 4% broken for medium grain California rice in Sacramento in mid-August 2001]. Several of the wholesalers were selling low quality rice to owners of construction sites that had been in storage for 2 years for 1.60 to 1.80 yuan/kg. There is so much competition in both wholesaling and retailing, according to our interviews that the average gross margin between the*

wholesale market and retail sites (which in Dalian is mostly in either wet markets or retail shops) is between 5 and 15 percent. This accords with our observations on prices; rice was being sold in retail markets for 2.10 yuan/kg to 2.90 yuan/kg. More than half of the retailers claim to be losing money because of the thin margins. In Shanghai, local Japonica rice (from the Lower Yangtse Valley—North Bank) in the wholesale markets in late July was about the same price, from 1.70 yuan/kg to 1.90 yuan/kg (note the quality is a bit lower and transport costs are lower—compared to those in Dalian). Local Indica varieties were selling for 1.50 yuan/kg. The price of Northeast Japonic rice from the Shanghai wholesale market ranges was about 2.30 yuan/kg. Note that the difference between the Dalian wholesale price and the Shanghai wholesale price for Northeast Japonica is roughly 0.30 yuan per kg, which is almost exactly equal to the price of shipping the rice by train (0.26 yuan/kg) or by ship (0.10 yuan/kg + loading and unloading at the docks (about $2 \times 0.05 = 0.10$ yuan/kg). Margins are equally low (between 5 and 10 percent) between wholesalers and vendors in wet markets and local grain shops in Shanghai.

Imported rice: Nearly 100 percent of imports to China in 1999 and 2000 were Thailand Jasmine rice (166,000 tons in 1999; 237,000 tons in 2000). In Tables 7 and 8, we show the figures that we got from China's custom's bureau for paddy rice imports for 1999 and 2000. All shipments were arranged by COFCO, all came into the port of Guangzhou or Shenzhen, and the imports were designed to meet the demand for extremely high quality rice in southern China.

Tables 9 and 10 show the imports of milled rice—which totaled only 167,000 tons in 1999 and 238,000 tons in 2000. The average Guangzhou import price for the milled rice in 1999 was \$US460/ton and in 2000 was \$US470/ton. Interestingly, the US shipped 600 tons in 1999 (for \$US620/ton) and 264 tons in 2000 (for \$US710/ton).

Exported rice: In contrast to a strategy in which China imports very high quality rice, it appears as if they have a strategy of exporting low quality rice. According to customs data (Tables 11 and 12), China exported 2.5 MMT of milled rice in 1999 and 2.8 MMT in 2000. On average, the unit value for exports in 1999 was \$US230/ton and in 2000 was \$US185/ton. This level of exports is in the middle of the range of prices that Vietnamese exporters were earning for their exports in 1999-2000 (from \$US160/ton to \$US200/ton—FOB Saigon). But this price is quite a bit below the prices that we were observing in China's wholesale markets in August 2001 (around \$US240/ton), even after price had dropped over the past year. According to our data, the average urban wholesale price of rice in 1999-2000 was about 2.00 to 2.80 yuan/kg (or \$US250/ton to \$US337/ton). China's top 5 customers for milled rice in 1999 and 2000 were: Ivory Coast, Indonesia, Cuba, Iraq, Philippines, Russia, and Malaysia (all of which purchased, on average, over 100,000 tons during each of the two years). The average export price (excluding Russia—which is importing Japonica?) was \$US215/ton in 1999 and \$US190/ton in 2000.

China also sold South Korea 116,000 tons of brown rice in 1999 (though this was actually less since China actually shipped brown rice and this is paddy equivalents) and 131,000 tons of brown rice in 2000 (Tables 7 and 8). This rice was of much higher quality, since even though it was shipped in rough rice form, its unit value was \$US 310/ton in 1999 and \$US250/ton in 2000.

8. What are the primary entry points for rice imports? For high-quality rice imports?

All of China's imports in 1999 and 2000 were Jasmine rice from Thailand. Almost all of the rice came into Guangzhou and Shenzhen. It should be noted, however, once the rice arrived in these ports, they are often handled by importers, grain trading companies, and packagers who re-ship them to different locations around China.

To document the flow and pricing of Thai Jasmine, we have created charts illustrating the physical flow and pricing of Thai Jasmine (Figures 19 and 20). As can be seen, 70 percent of imports are brought in by rice traders and 30 percent by rice processing factories. These factories are mainly packagers of rice that in turn ship the packaged rice to retailers in Guangzhou and other parts of China. Some of the rice from importers goes back (indirectly) to rice packaging plants. As you can see most of the rice that comes in through rice traders, goes to hotels and restaurants; most of the rice that comes to processing plants goes to supermarkets after it is packaged.

According to a number of our interviewees, both those in official and unofficial positions, China has not imported rice from Vietnam (as it allowed Yunnan and Guangxi provinces to do in 1996 and 1997—though we did not go to these provinces ourselves). Traders tell us that in recent years, no rice is smuggled from Hong Kong.

9. What duties are paid on imported rice?

Imported rice is currently subject to a 1% duty; 1.5% agency fee (for COFCO); and a 13% value added tax (VAT). Upon WTO membership China has committed itself to a in-quota duty of no more than 1% for the first 2.66 mmt of rice imports (half long grain half Short/medium grain) with the total doubling in 2004. After accession to WTO, it is expected that imported rice will still be subject to the VAT.

*We have been told that the VAT is not collected on much of China's domestic rice (and other agricultural commodities, for that matter). None of the rice traders we talked to had thought much about the fact of equal treatment that had to be applied in the post-WTO period, since there is not much excitement about rice importing after China's accession. This should be a bigger issue for those commodities that will be imported in bigger quantities. This is an issue for all commodity groups outside of China to watch in the coming years. The biggest problem may be one of implementation, even if leaders really want to impose the tax domestically. With the extremely fragmented markets and the direct routes from farm to small mill to trucking company to wholesaler, it is easy to see how rice can escape the tax assessment process. For a good description of China's marketing channels, see our description in Huang and Rozelle, 2000, *Economic Development and Cultural Change*; and Luo's dissertation, 1999.*

10. What certification is required for rice importations?

Currently, to import rice, qualified domestic grain trading and processing companies need to apply to the provincial planning commissions (or grain bureaus) of their respective provinces for import permits. To qualify, firms need to show they need the grain and they usually must have had a history of importing and using imported grain. Over two-thirds of the permits are granted to companies in Guangdong. There actually are quite a large number of companies that import rice in Guangdong (more than 100), though two companies in Guangdong and three companies in Shenzhen are allocated about half of the permits. Other companies get permits that range in size from 500 to 2000 tons. The government puts strict limits on the quantity and quality of rice that it allows in. Basically, they only grant permits for companies that want to bring in high quality Thai Jasmine rice. Once firms get a import permit, they then have two options: one, is to meet with a Thailand rice exporter and arrange a deal, which afterwards must be executed by China's single-desk state trader, COFCO; two, is to ask COFCO to arrange the deal for them. Besides this there is really not any other certification requirements. All of this will change when China enters the WTO.

Interestingly, although the other 30+ percent of the import permits are given to companies outside of Guangdong, well over 90 percent of the rice is still imported by Guangdong companies. In recent years, permits have become tradable. If a company in some other province gets a permit to import rice, because they have little experience in doing so, they often find it more profitable to sell their permit to a Guangdong company. Of course, since there are many companies that want to import rice, the permit is worth something and companies that hold them can sell them for much of what they are worth. In the past when rice prices were high and demand for foreign rice was high, the permits were worth up to 500 yuan per ton. Now, with rice prices so low and with the demand for high quality rice down (after the onset of the Asian Financial Crisis), the value of the permits are less than 100 yuan per ton. After the Guangdong companies import the rice, about one-third of it is transshipped onto grain trading and processing firms in other provinces. For example, all of Shanghai's Thai Jasmine rice is imported by a Shenzhen company and shipped to the several wholesalers and packagers that handle all of Shanghai's Thai Jasmine.

To understand the process of imports and exports, we have created a series of figures on the process of importing into and exporting from China (Figures 21, 22, 23, 24). In these illustrations, we show the actors who are involved in handling the rice physically and financially.

11. What are the steps to the end-user after importation?

After rice enters the country, it goes directly into the control of the importing company. There are few, in any restrictions, on how it is used or processed. COFCO does not run any rice mills or packaging plants (though this is different in the case of soybeans – they and other importers have invested heavily into crushing plants, a fact that has tilted the government’s decision in favor of importing soybeans instead of soybean oil).

12. Is rice importation a centrally planned decision, or is it broken down provincially?

It is said that the topmost leaders in the State Council are those responsible for setting import targets each year. After all of the provinces make their requests at the end of the previous year for the amount of rice that they want to import, the State Planning Commission in Beijing makes the decisions and informs the provincial planning commissions how much rice they are authorized to import. No one told us that provinces were able to bring rice on their own authority.

We show the process and actors involved with the planning of imports and exports (Figures 25 and 26).

13. What are the trends for short/medium grain production in northern China?

Of China's 31 million hectares of rice sown area, about 8 million hectares are sown to Japonica varieties (Table 13). Of the 8 million hectares of Japonica nationwide, 7 million hectares are in a.) the three Northeast provinces, China's main "pure" Japonica rice region (Heilongjiang, Jilin, and Liaoning); and b.) the North Bank of the Lower Yangtse Valley (primarily Jiangsu and Anhui Provinces) and Zhejiang Province. In the late 1990s (average of 1998 to 2000), production was 39 million tons (about 20 percent of all of China's 199 million tons).

Growth of Japonica rice sown area, yield and production in these provinces has been high during the 1990s (Table 14). In all of China, Japonica sown area grew by 3.52 percent annually during the 1990s; yields by 2.94 percent annually; and production by 6.07 percent annually. This means that since the late 1980s, the production of Japonica doubled! In decomposing the growth of Japonica area, it can be shown that 50 percent of the rise in the 1990s came from production increases in Jiangsu Province; 40 percent of the rise came from production increases in Heilongjiang Province (Table 15). Anhui Province contributed another 16 percent. [NOTE: these figures do not add up to 100, since Japonica sown area in some provinces fell.] In other words, all of the growth has come from three provinces, a fact that should make it easier for observers to track production changes in the future (Figures 27 and 28). New Japonica sown area in Jiangsu and Anhui provinces mainly came from conversions of sown area out of Indica varieties. New Japonica sown area in Heilongjiang mostly came from the creation of new irrigation systems, and to some extent to conversions out of soybeans. Japanese and South Korean investors have focused most of their attention on production in Heilongjiang.

14. What is the anticipated demand for high-quality short/medium grain rice in the north and east in the near and intermediate future?

The demand for Japonica rice has been growing steadily and keeping up with supply. Most of this demand is in the North and East as is most of the production. The highest quality is from the Northeast with lower quality japonica from the coastal provinces in the lower Yangtze basin near Shanghai (Jiangsu, Anhui and Zhejiang).

A couple of thoughts:

1.) If there is a continued rise for high quality Japonica rice in Shanghai and surrounding cities (e.g., Hangzhou and Nanjing) and richer rural areas, it could be that there is a regional market emerging for US Japonica. Several factors make this a possibility. One is that most of the consumption in Shanghai is from the local production area (which it is!—see Figure 10). Two is that the scope for further production gains for Japonica may be limited. Most of the rise in area has come at the expense of Indica Rice (Table 16 and Figure 29). There are almost certainly physical limitations to future increases in sown area; China may not have reached the limit, but the scope to change may be decelerating. Three is that it could be the rise in demand in the north may be enough to absorb the increase in Japonica in the Northeast. Four, it could be that the cost of shipping rice to Shanghai from Sacramento may not be much more than shipping rice to Shanghai from Heilongjiang. The price of shipping rice from Heilongjiang to Dalian is 200 yuan per ton (or about 25 dollars per ton—Figure 30); the price of shipping rice from Dalian to Shanghai by ship is 100 yuan per ton (or another 12 dollars per ton). If one can assume that all of the handling of rice in the wholesale markets and ports in Dalian is around 10 dollars per ton, then the total per ton cost of getting grain from Heilongjiang to Shanghai could be $25+12+10 = 47$ dollars per ton. [It could be that if there were improvements to the train system, this could fall – unless the demand for other commodities, for example, iron ore, timber and coal rises faster].

2.) More immediately, is there a niche market to produce and export high quality Japonica for the rising number of Japanese and South Korean business persons in China in the same way that Thai Jasmine is imported for Hong Kong business persons.

15. Will there be any niche that U.S. long grain rice can fill in southern China given the entrenched competition from Vietnam and Thailand? Are there any structural obstacles U.S. rice imports would face versus Asian rice imports? Specifically, U.S. long grain versus Thai Jasmine and Indian Basmati rice?

The biggest obstacle may be one of name recognition and quality perception. When we went to the field and interviewed literally 100s of traders, processors, administrators, and others involved in the rice industry, we asked every single one of them if they had ever handled US rice or if they would be willing to do so. The most common response: “ Do farmers in the United States grow rice?”

The challenge will be finding the right niche market. For example, the main consumers of the super-high quality Indicas, business persons from Hong Kong and Southeast Asia, already have strong established preferences for Thai Jasmine.

Currently there is almost no (and, to our knowledge, there never has been) Indian Basmati in China. Vietnam is NOT entrenched in China. Vietnamese rice, according to our interviews has not been in China since 1997.

It is interesting that production declines (Tables 14 and 16 and Figures 29, 31 and 32) and the lowest rates of TFP increases are found in Indica regions (Table 3). Could it be that production could be falling so much that China would need to import Indica rice to meet its Indica rice demand? When looking at the fall in production, we actually can see that it is in areas in the richest provinces, and farmers in these areas have switched to other crops. The deceleration in yields can actually be traced to the fact that China’s research system is switching from a strategy of high yield to a strategy emphasizing high quality (Table 17). In summary, the fall in Indica area probably is not so much a failure of China’s Indica rice supply as it is a response to a shift in the demand for quality.

In summary, there probably is not much of a market future for US Indica rice in China.

16. What are the attitudes of the trade and consumers concerning rice, foreign rice and U.S. rice?

Rice is a basic staple for almost a billion people, but for the higher income urban population that could be a market for high quality imported rice it is also a food to be enjoyed for its taste and texture. Among this population foreign rice can have a place if it brings something distinctive, such as the aromatic jasmine rice from Thailand. Currently, there is no appreciable awareness of the United States as a supplier of rice. The United States is a supplier of certain luxury foods, such as oranges, but rice awareness is close to zero even in the trade.

It should be noted, however, that many of China's consumers place value on being able to consume new and somewhat exotic food. Foods from abroad, including (perhaps especially) the U.S., have appeal for certain groups of consumers. The attitudes of Chinese consumers are different from those of Japanese consumers. Any future promotional efforts need to take this into account.

17. What opportunities for U.S. rice will exist after China joins the WTO?

One key here is the ability to work with private traders, including the multinational trading companies that are already in China—e.g., Cargill; Bungee; etc. The challenge is to build awareness of the high quality and a distinctive character of U.S. rice. With the large share of japonica imports in the hands of private importers it may be possible to build on the import success of almonds and citrus to tied japonica rice imports to a California image. One might also tie the California japonica rice image to Japanese foods and “California roll.” The long grain market will be much more in the hands of the government but by 2004, just a few years away more than one-quarter million tons of imports will be available through private traders.

18. Will there be an import licensing system that can be manipulated following WTO accession?

No one yet really knows what will happen when China is actually in the WTO late this fall. Certainly, the government of China may try to make access as hard as possible and licensing is GATT-legal and often used to keep a handle on imports. The United States government will need to be vigilant and the industry will need to keep the pressure to make sure access is being provided according to the agreements. Fortunately the government of China knows that the world will be watching and it does not want to face and lose a host of WTO disputes in the first few months of its long awaited WTO membership. Because of its relative competitiveness in producing rice, officials may place less attention on this crop in the immediate post-accession period.

19. Once WTO accession occurs, what barriers to market entry will there likely be for U.S. rice, e.g. price, other taxes or charges, or requirements/practices relative to transportation, distribution and marketing?

It is not GATT-legal to add barriers to commerce that do not apply to domestic rice. And with a mixture of private and government-controlled imports it will be harder for the government of China to succeed in applying costs on imported rice that do not apply to domestic rice. Again the industry will need to be vigilant to make sure that these practices are not allowed to become established.

20/21. What promotional activities and educational efforts are recommended in the initial stages of our marketing effort in China? What regions/locales should those efforts be focused on?

We noted above that promotions of japonica rice could be successful with a California flavor. There may be an organic market as well. The experience of the orange and almond industries may help. Marketing rice as a low-priced bulk product competing head-to-head with rice from China or low cost imports seems very difficult. Thus, the approach of the other grain industries—e.g., the wheat, feed, and soybean industries--seem less relevant. Clearly the focus may be in the growing high quality japonica segment and that means the North Coast cities from Shanghai up. As we discussed in section 14, Shanghai may be a particularly good opportunity. It is harder to see the role for U.S. Indica rice.

22. What information and events could influence the acceptance of U.S. rice?

The main issue is that the United States is not seen as a rice country. It is known, however, that California is a producer of high quality agricultural commodities. Perhaps one connection would be to tie U.S. rice to the long tradition of Asians in the United States. The current Secretary of Labor and other prominent Asian-Americans might be used in this way. The long build up to the Olympics may provide some promotional tie-ins. Chinese are aware of the United States as one of their competitors for sport supremacy. This may allow connecting to rice as healthy food connection. Little promotion is currently done by domestic trading and packaging firms.

Since there may be scope for more private rice imports that pass by the government's control after WTO, it could be that strategic alliances with established trading, processing and retailing companies that are offered an incentive to handle U.S. rice will be helpful.

23. What quality, service or financing advantages could the U.S. offer? Would the U.S. government's GSM-102 financing be an advantage?

Certainly quality is key and service must accompany the product which does not now have a market. Financing is an unexplored area. According to August data, the USDA GSM 102 had \$300 million allocated for China and Hong Kong for fiscal 2001 and none of that was used as we near the end of the fiscal year. Of the \$50 million allocated under the Supplier Guarantee Program for 180-day credit, applications for a total of \$0.26 million had been received. The credit guarantee programs offer an opportunity for US companies to deal with Chinese counterparts who might not otherwise qualify, given the nature of the legal and banking systems in China. Some training of the Chinese companies may be required to help them become familiar with how to use GSM programs.

On the China side, we have found out that a handful of the largest rice importers (specifically the Guangdong and Shenzhen companies with large quotas) have received loans from commercial banks in order to be able to execute their trades. They were able to get the loan on the basis of having the quota. Most trading companies, however, are unable to get such loans. They must use their other assets, in particular, their real estate holdings, to secure their loans. Hence, it could be that there would be traders attracted to such financing arrangements.

24. Will strategic alliances with established rice traders be necessary in our initial marketing efforts?

The idea of alliances is interesting and may be necessary for building a market with urban customers. If the U.S. firms or organizations committed to help build the market for the long-term traders in China might be more willing to invest their own time and other resources. But, this would not be the traditional traders who want only the lowest price. Perhaps firms that handle jasmine rice may find another “specialty” rice would be successful.

25. Which organizations are well positioned to import once WTO accession occurs?

There are many large, well-run trading companies in China. There are also a lot of firms that are not well-run. Some of these firms have experience in importing grain and putting it efficiently into China's domestic market. These may be the firms that are best positioned after WTO.

Large multi-national trading companies that already have well-established domestic connections.

Larger commodity-oriented companies with solid financial basis and incentive structures for management that will ensure firms are run on the basis of long-run, profit maximization.

It may be that traders in Shanghai, or food processors, mills or rice packagers, would be the ones that would make the best partners. These business persons would be attracted by the financing that the US could provide; they would want to have as secure as funding as possible, which might be difficult if demand runs ahead of supply in the Lower Yangtse Valley; and Shanghai business persons may have the drive and connections to make investments into branding and stocking in the Shanghai rice retail market.

B. China Rice Exports:

The customs information for China's rice exports by destinations for 1999 and 2000 for paddy are in Tables 18 and 19; those for milled rice are in Tables 11 and 12.

26. What is the financial, title/control and physical movement chain from paddy grown by the farmer to milled rice FOB vessel?

There are multiple channels in the marketing chain (see the same figures that were referenced in Question1, paragraph 3—Figures 7 to 15). The one thing that distinguishes each node, however, is that there are many choices and there are many players in each and every point in the chain.

Farmers sell grain to private traders who come to their door; to commercialized state-owned trading companies; to traders in periodic markets. Rural wholesalers sell to many different traders that consolidate many small purchases. These companies sometimes own their milling facilities. They sometimes own their own trucking equipment. Frequently, the companies that ship large shipments across provincial boundaries are former state-owned grain companies that are now commercialized. These companies use connections to banks; train and shipping firms; and buyers in urban areas to gain a competitive advantage over other firms that want to get into interprovincial trade. There is almost no place that we ran into where there was a monopoly, however. In cities, grain moves from wholesalers, to secondary wholesalers, to retailers.

In almost all cases, transactions are done by cash and done on a spot basis. There have been attempts at promoting future markets and future contracting, but most of these have suffered from lack of enforcement.

Once in the wholesale market, those firms that want to export, can purchase the amount of grain that they want to export. In other cases, export companies will order grain directly from their associated in rural areas. Grain can be ordered, procured, milled to specification, and shipped in 48 hours. Trucks are often used to ship grain directly to the port from which exports are made. Rice can move from the farmers stocks to an ocean-going freighter in less than 5 days!

27. Looking forward through the next ten years, how large a competitive threat is Chinese high-quality short/medium grain rice to U.S. short/medium grain in Japan, Korea, Taiwan, Singapore, Malaysia, Turkey and Jordan?

What makes this question so hard to answer is that it involves both supply and demand for quality and quantity by type within China. Further, the quantities involved are significant compared to US exports, but absolutely tiny compared to total rice production in China. Two scenarios are equally likely. (1) As China's own domestic demand for high-quality japonica grows rapidly, its production just barely keeps up with that demand. This is a profitable market for China's producers and the quality demands within China are just within their reach but they are not able to competitively meet the demands for reliability from the export markets listed. (2) Although the domestic demand for japonica rice grows rapidly, producers and exporters in China (partly with investment from importers) are able to reserve 10 percent of the expanded production base for producing high-quality japonica rice for export. This arithmetic means China could place 2 million tons of exports into the high-quality japonica export market, approximately equal to the whole production of California.

A lot will depend on the factors that allow for the continued increase in yields (since the prospects for continued expansion and conversion remain limited). China's research system has done a lot in the past to keep its farmers competitive. With the aid of investment from Japan and South Korea, it may be that future increases in TFP will keep up with past, and this will make the second scenario more likely.

China also has created a number of GM rice products that have already passed greenhouse and field trials. China's top leaders have held up the release of these varieties because they fear that exports would be hurt. Some of the new technologies, however, would significantly reduce the cost of production of rice production in China (e.g., there are varieties that are resistant to leaf folder and plant hopper, two of China's greatest pests). Hence, observers should carefully watch for what happens in this area. Certainly, releasing GM rice would reduce the prospects of imports. But, if certain importing countries refuse to take China's rice as a consequence, the market for US rice could be enhanced.

28. What are China's true costs of: production/hectare, milling per 100 pounds, inland freight and port and loading?

Of course, the answer to this question varies widely by type, quality and location. China can compete at the low end of the indica spectrum with some of the cheapest rice in the world market.

In our information on cost of production, we report the average cost of production for Indica and Japonica in 1999 (Table 20). The year to year costs do not vary to much between 1997 and 1999, since inflation was not very high. We divide costs into direct (or variable) cash expenses; operating own capital expenditures; and total taxes and fees paid for the land (since China's farmers do not pay rent per se, this is really the equivalent). These are deducted from total revenues, which are just yield times the price of the output, to get total return to labor and management. Since almost no labor is hired in China for on-farm work (outside of custom services—which are deducted in the variable expense section), we waited to deduct imputed labor costs. The final row, which is the total “profits”, is actually the return to the family's management, entrepreneurship, capital, and normal profits.

29. What type of production, milling or infrastructure restrictions does China have that might disadvantage them as a competitor?

China has quality problems throughout its grain system. This is particularly important for rice. At one time (as late as the early 1990s), when the state completely dominated grain trade, little effort was put on quality milling, timely handling, and careful storage.

But, as the demand for quality within China has grown and continues to grow with income, and as the food system has become increasingly commercial and private, the food system has and will continue to adapt to provide what customers within China and outside China demand. The ability of the research system to adapt and produce the varieties that are asked of it is unparalleled in the developing world. The transformation of the milling industry in China has been rapid and comprehensive. Whether China can continue do that at competitive prices as demand for quality continues to grow is another matter. Much of the high-quality rice is grown in the northeast and that is not the area where the biggest high income population is growing, so transport cost is a problem. But, the advent of trucking as an industry and small and flexible ocean-going cargo vessels appears to be leading to rapidly falling transaction costs (though costs remain relatively high on a per ton per kilometer basis).

30. Is there any information on grower subsidies for rice? What is it? How is it determined?

Explicit grower subsidies for rice are minor at most. There may be some broad-based irrigation subsidies. The grain quota system has often been a tax (see paper in appendix: Huang and Rozelle, 2000, Economic Development and Cultural Change), although for 1998 and 1999 there may have been a subsidy involved. Recent evidence shows that now it is neither a tax nor a subsidy. China's farmers who have always consumed most of their own production, are now only selling a small fraction of the grain that they sell to the state (Tables 21, 22, 23a). And, when looking at the price that they receive from the state versus the price that they receive from private buyers, it can be seen that there is no subsidy (Table 23b). The price that the farmer receives from either buyer is almost exactly the same.

Outside of agriculture, there are implicit credit subsidies through lack of repayment to state-owned banks. Farmers, and to our knowledge traders, receive none of this benefit. Such subsidies really place farming at a relative disadvantage in the domestic economy.

In certain localities in certain time periods there has been subsidies paid by the local government to the companies that have exported rice. These payments are much lower than those received by traders exporting other crops (it is presumed that the reference here is to corn). [It should be noted here that unlike almost any other part of the interviews, many (though not all) traders and officials were somewhat reluctant to talk about this topic.] Several of the traders that did talk to us, actually told us that they have been told that such subsidies will end when China enters the WTO.

31. For a Chinese farmer, what are the potential substitutes for rice in the north and south?

In the Northeast rice has been substituting for corn and being put on new land. Near the coast, near cities, and throughout the South fruits and, especially, vegetables, substitute for rice. Most of China's rice outside of the North and Northeast (over 95%) is grown in a double cropping system. Thus, part of the substitution question related to the whole farming system because the two crops must fit together. In Jiangsu and Anhui provinces, the two provinces that have accounted for more than 60 percent of the growth of Japonica rice since 1990, Japonica rice has been planted in place of conventional Indica varieties.

32. At what point will rice farmers opt for growing the substitutes? Is there a benchmark at which they would switch or they continue to produce rice in deference to other crops?

There is a whole range of alternative crops that may be grown on what is now paddy land. As the government restrictions are further relaxed, more of that will consider alternative crops. In the South, along the coast and near cities more land will continue to move towards fruit and vegetables. But this is only a fraction of the current paddy area. In the Northeast, especially Heilongjiang there has been a steady and rapid shift toward japonica rice and this has been enough to offset reduced area of indica rice. Water problem could reduce rice in the North China plain, but rice is already a minor crop there. The geographic complexity and the widespread nature of rice production in China means there can be no “one size fits all” answer to this question.

It is interesting that in the case of rice, the relative price of rice has outperformed that of several other major commodities since 1990 (Figure 33). The relatively robust performance of rice versus that of other crops in the 1990s may say more about the poor performance of all crop prices than the outstanding performance of rice.