

**Department of Agricultural and Resource Economics
University of California Davis**

**China's Accession to WTO and
Shifts in the Agriculture Policy**

by

Jikun Huang and Scott Rozelle

Working Paper No. 02-002

January, 2002



Copyright © 2001 Jikun Huang and Scott Rozelle
All Rights Reserved. Readers May Make Verbatim Copies Of This Document For Non-Commercial Purposes By
Any Means, Provided That This Copyright Notice Appears On All Such Copies.

**California Agricultural Experiment Station
Giannini Foundation for Agricultural Economics**

Draft: January 22, 2002
MOA-FAO Office

China's Accession to WTO and Shifts in the Agriculture Policy

Jikun Huang
Center for Chinese Agricultural Policy, Chinese Academy of Sciences

Scott Rozelle
Department of Agricultural and Resource Economics, University of California, Davis

A Report to FAO

China's Accession to WTO and Shifts in the Agriculture Policy

Although agriculture has been at the center of China's negotiations over its entry into the World Trade Organization (WTO), the likely shifts in China's future agricultural policy and its impacts are not well understood. Debates on future China's food security are growing. Some argue that the impacts of China's joining WTO on its agriculture will be substantial (Carter and Estrin, 2001; Li et al., 1999). Others believe that although there will be some impacts, in some specifics even severe, overall the effects of accession on agriculture will be modest (Anderson and Peng, 1998). In part, the confusion about the ultimate impact of WTO can be traced to a general lack of understanding of the policy changes that may be induced from China's WTO accession (Martin, 2002). Curiously, despite the importance of the issue and interest of China's own and the international community, few if any works have sought to identify such policy responses.

The overall goal of our paper is to explore this question of how China's policy will likely respond as the nation enters the WTO. Specifically, we will have three objectives. First, we briefly review China's existing agriculture policy and past performance of China's agriculture and how it has changed during the past 20 years of reform. Next, we examine the main features of the agreement that China must adhere to as they enter WTO. Finally, we consider a number of possible ways that policy makers may respond, primarily focusing on the national government's viewpoint.

Changing role of agriculture in the Chinese Economy

China's economic liberalization and structural change have proceeded for several decades. Since the economic reforms were initiated in the late 1978, China's economy has grown substantially. For example, the annual growth rate of GDP was 8.5% in 1979-84 and

9.7% in 1985-95 (Table 1). Moreover, despite the Asian financial crisis, China's economy continued to grow at 8.2% annually between 1996 and 2000. Foreign trade has been expanding even more rapidly. China's trade to GDP ratio increased from 13% in 1980 to 44% in 2000 (NSBC, 2001).

Although reform has penetrated throughout the whole economy since the early 1980s, most of the successive transformations began and in some way depended on growth in agricultural sector (Nyberg and Rozelle, 1999). After 1978, decollectivization, price increases, and the relaxation of local trade restrictions on most agricultural products accompanied the take off of China's agricultural economy in 1978-84. Grain production increased by 4.7% per year. Even higher growth was enjoyed in horticulture, livestock and aquatic products (Table 1). Although agricultural growth decelerated after 1985 after the one-off efficiency gains from the decollectivization, the country still enjoyed agricultural growth rates that have outpaced the rise in population (Table 1).

Despite the healthy expansion of agriculture, the even faster growth of the industrial and service sector during the reform era has begun to transform the rural economy, from agriculture to industry and from rural to urban. During this process, the share of agriculture in national economy has declined significantly. Whereas agriculture contributed more than 30% of GDP before 1980, it fell to 16% in 2000 (Table 2). During this same time, agriculture's share of employment fell from 81% in 1970 to only 50% in 2000.

The rapid economic growth, urbanization and food market development have boosted demand for meats, fruits and other non-staple foods, changes that have stimulated sharp shifts in the structure of agriculture (Huang and Bouis, 1996; Huang and Rozelle, 1999). For example, the share of livestock output value more than doubled from 14% to 30% in 1970 to 2000 (Table 2). Aquatic products rose at an even more rapid rate. One of the most significant signs of structural changes in the agricultural sector is that the share of cropping in total agricultural

output fell from 82% to 56%. Moreover, the most significant declines in crop-specific growth rates have been experienced in the grain sector (Table 1).

Changes in the external economy for agricultural commodities have paralleled those in domestic markets. Whereas the share of primary (mainly agricultural) products in total exports was over 50% in 1980, it fell to only 10% in 2000 (Table 2). Over the same period, the share of food exports in total exports fell from 17% to 5%. The share of food imports fell from 15% to 2%.

Disaggregated, crop-specific trade trends show equally sharp shifts and suggest that exports and imports increasingly are moving in a direction that trend toward products in which China has a comparative advantage (Table 2 and Figure 1). The net exports of land-intensive bulk commodities, such as grains, oilseeds and sugar crops, have fallen; exports of higher-valued, more labor-intensive products, such as horticultural and animal (including aquaculture) products, have risen. The proportion of grain exports, which was only around 20% of total agricultural exports in the 1990s, is less than half of what it was in the early 1980s. By the late 1990s horticultural products and animal and aquatic products accounted for about 80% of agricultural exports (Huang and Chen, 1999). These trends are even more evident when reorganizing the trade data grouping them on the basis of factor intensity (Figure 1).

Taken as a whole, we believe the trends of China's economic structure and agricultural trade over the past two decades reveals that the changes that are expected to be experienced as a result of WTO are not new. Changes in the structure of economy and agricultural production and trade suggest that China was already moving towards a point that was more consistent with its domestic resource endowments. To the extent that the new trade agreements reduce barriers to allow more land-intensive products into the domestic market and the fall in restrictions overseas stimulates the export of labor-intensive crops, WTO main impact will be to push

forward trends that were already happening on their own. The commitments that China provided in its WTO Protocol of Accession are largely consistent with the nation's long-term reform plan.

Agriculture policy in the reform period.

Despite the continuity with the past, few can dispute that the terms of China's WTO accession agreement pose new challenges to the agricultural sector. In some cases, there will likely be large impacts on rural households, and will undoubtedly elicit a sharp behavioral response (Rozelle and Huang, 2000). However, the nature and severity of the impacts will not only depend on how households respond. Perhaps of even greater importance will be how China's agricultural policy makers will manage their sector as the new trade regime takes effect. To examine this set of issues more carefully, in this section we first review agricultural policy during the reform era. In the next section we will then see how WTO measures will change the environment in rural China.

Fiscal and Financial Policies. While government expenditures in most areas of agriculture have increased gradually during the reform period, the ratio of agricultural investment to agricultural gross domestic product (AGDP) has monotonically declined since the late 1970s. In 1978, officials invested 7.6 percent of AGDP (NSB, 2001). By 1995, the proportion of AGDP committed to investment fell to 3.6 percent. Exceptions were only recent years in the late 1990s when this ratio rose. Moreover, a significant capital outflow from agriculture to industry and rural to urban has occurred during the last two decades through the financial system and government agricultural procurement (Huang and Ma, 1998; Nyberg and Rozelle, 1999).

Foreign Exchange and Trade Policies. China's policies governing the external economy have played a highly influential role in shaping the growth and structure of agriculture for many decades. During the entire Socialist Period (1950 to 1978), the overvaluation of China's

domestic currency destroyed incentives to export effectively isolating China from international exporting opportunities (Lardy, 1995). After the reforms were initiated, however, officials allowed the real exchange rate to depreciate by 400% between 1978 and 1994. Except for during the past few years when the exchange rate has experienced a slightly re-appreciation, adjustments in the exchange rates throughout most of the reform period have increased export competitiveness and contributed to China's export growth record. These, in turn, have helped the overall expansion of the national economy. Perhaps more than anything, China's open door policy, including its exchange rate policy, has contributed to the rapid growth in the importance of the external economy.

Rural Development and Labor Market Policies. The shift of labor from the rural sector to the urban sector lies at the heart of a country's modernization effort and China has been experiencing this primarily two ways: by the absorption of labor into rural firms and by movement of massive amounts of labor into the off farm sector in cities. Rural industrialization has played a vital role in generating employment for rural labor, raising agricultural labor productivity, and farmer's income. The share of rural enterprises (or RE) in GDP rose significantly from less than 4% in the 1970s to more than 30% by 1999. REs have dominated the export sector throughout the 1990s (NSBC, 2001). And, perhaps most importantly, REs employ 35% of the rural labor that works off the farm. In addition to formal wage earning jobs in rural areas, a large and rising part of the rural labor force (rising from 8 percent in 1990 to 13 percent in 2000, de Brauw et al., 2002) also works in the self-employed sector.

At the same time, although China's factor markets still contain a number of structural imperfections, such as employment priority for local workers, housing shortages, and the urban household registration system, labor has poured into the cities during the last 20 years and labor markets emergence are transforming the economy (Lin, 1991; Lohmar, 1999; de Brauw et al., 2002). According to a nearly national representative survey of 1200 households across China, it

is found that more than 100 million rural workers found employment in the urban sector in the late 1990s (deBrauw et al., 2002). In fact, to an extent never found before, China's labor markets have allowed migration to become the dominant form of off-farm activity; been increasingly dominated by young and better educated workers; expanded fastest in economies or areas that are relatively well-off; and recently begun to draw workers from portions of the population, such as women, that earlier had been excluded from participation. According to the work on some researchers, if China continues to change at the pace it has in the past 20 years, and other provinces experience the same changes that have already occurred in the richest provinces, China's economy will continue to follow a healthy development path and be on the road to modernization.

Technology Development Policies. China has a strong agriculture research system that has generated technologies adopted by millions of farmers to meet the increasing demand of food and agricultural products in the most populous country in the world (Stone, 1988). All previous studies consistently show that research-led technological change is the main engine of agricultural growth (Fan and Pardey, 1997; Huang and Rozelle, 1996). Technology produced by China's agricultural research system accounts for most of the rise in the cropping sector's total factor productivity between 1980 and the late-1990s (Jin et al., forthcoming).

Despite this past record, China faces considerable challenges. Although as a publicly funded agricultural research system, it functioned well and addressed many important problems, its expenditures have been tied to public budgets. Falling fiscal support has taken its toll. Currently, there is much concern that agriculture research investment intensity has declined since the early 1980s and reached a dangerously low level, only 0.44 in 1999 (Huang and Hu, 2002). At the same time, the increasing evidence of overlapping, inefficiency, over-staffing, and inappropriate technology make fundamental reform of the current research system an essential task.

Food Price and Marketing Policies. Price and market reforms were key components of China's policy shifts from a socialist to a market-oriented economy. The reforms associated with China's policy reforms, however, began slowly and have proceeded gradually. Market liberalization began with non-strategic commodities such as vegetables, fruit, fish, livestock, and oil and sugar crops. Little effort was made on the major crops. And, although the aims of the early reforms were to raise farm level prices and gradually deregulate the market, most of the significant early reforms were done by administrative measures (deBrauw et al., 2001). However, as the rights to private trading were expanded in the early 1980s, and official allowed traders the to buy and sell the surplus output of almost all categories of agricultural products, the foundations of the state marketing system began to be undermined.

Since the mid-1980s, market reforms have continued though only in a stop and start way. For example, after record growth in agricultural production in 1984 and 1985, a second stage of price and market reforms was announced in 1985 aimed at radically limiting the scope of government price and market interventions and further enlarging the role of market allocation. Because of the sharp drop in the growth of agricultural production and food price inflation in the late 1980s, however, implementation of the new policy stalled. Mandatory procurement of grains, oil crops, and cotton continued. After agricultural production and prices stabilized in 1990-92, another attempt was made in early 1993 to abolish the grain compulsory quota system and the sale at low prices to consumers. The state distribution and procurement systems were substantially liberalized, but the policy was reversed when food price inflation reappeared in 1994: government grain procurement once again became compulsory. As well, a provincial governors' grain responsibility system was introduced in 1994-95, aimed at encouraging greater grain self-sufficiency at the provincial level. Further retrenchments followed; in 1998 the central government initiated a controversial policy change prohibiting individuals and private companies from procuring grain from farmers (who were supposed to deal solely with the

commercial arm of grain bureaus and the grain reserve system--although traders were allowed to operate in wholesale and retail markets). Grain quota procurement prices were set more than 20% higher than market prices, which meant a transfer in favor of those farmers able to sell at that price (Huang, 1998; Lu 1999). Not surprisingly, stocks started to accumulate and procurement and market prices had to come down relative to international prices in 2000.

Despite these periodic cycles in the reform process, markets have gradually emerged in rural China. The proportion of retail commodities sold at market prices has kept rising. According to Lardy (2001), the share for agriculture was just 6% in 1978 but had risen to 40% by 1985, 79% by 1995 and 83% by 1999. Moreover, the state's intervention was unable to halt the flow of grain across provincial boundaries. Huang and Rozelle (2001) find that agricultural prices for all major commodities, including rice, wheat, and especially for maize and soybeans have moved together across far reaching localities within China. Continuing the trends found in Park et al. (forthcoming), China's markets are becoming more integrated and efficient, and increasingly resemble those in more market-oriented economies.

What have these policies meant for nominal rates of agricultural protection in China? Tables 3 and 4 show recent estimates based on quota and negotiated procurement prices and on wholesale market prices since 1985 for selected agricultural commodities. The requirement that farmers submit a mandatory delivery quota at below market prices has represented a lump-sum tax on farmers and lump sum subsidy to the urban consumers who were able to get access to sales at below-market value (Sicular 1988). Between 1990 and 1997 the average price farmers received for compulsorily delivered grains and soybean was between one-eighth and one-third below the border price. In the late 1990s, however, those prices were above the border price. Although all of China's major crops were affected, wheat and cotton, the nation's main imported farm commodities, received relatively favorable treatment relative to rice. That is true not only in each price category (Table 3), but also in that a higher proportion of rice production is

procured at the low quota procurement price. Meat producers, by contrast, still appear to receive less they would if they could sell their output at international prices. More-recent estimates by Huang and Rozelle (2001), however, take quality differences into account more carefully. Their estimates suggest there is less protection in place than Table 3 implies. In particular, wheat wholesale prices (in the quality grades that dominate the nation's noodle-wheat markets, by far the largest sector of the domestic market) may be no higher and possibly even lower than import prices of similar-quality grain. Recent structural shifts in soybean markets have made it so domestic soybean prices are only 15%, not 40%, above border prices.

In sum, despite substantial efforts to liberalize the price and market structure of China's agricultural sector, producers of major agricultural commodities continue to be penalized by commodity-specific policies of procurement. Despite that migration of farm workers to rural industrial and service activities, the average farm size and the share of farm household income from farming have fallen steadily since the late 1970s (NSBC, 2001). When the impact of the recent re-appreciation of the domestic currency is also taken into account, the situation is even worse (Huang and Rozelle, 2001). It is therefore not surprising that many farm families have invested their surplus funds and labor in non-farm activities rather than back into agriculture. Much of that investment has gone to REs and family-owned businesses. Employment, output and exports in these sectors have increased rapidly. The share of non-farm income reached 50% in 2000 (NSBC, 2001), and the per capita income differences between eastern, central and western provinces have persisted and even expanded (Kanbur and Zhang 2001).

China's commitments to WTO accession and provisions related to agriculture

In its most basic terms, the commitments in agricultural sector can be classified into 3 major categories: market access, domestic support, and export subsidies (Martin, 2001; Colby, 2001; Rozelle and Huang, 2001). The commitments on market accession will lower tariffs of all

agricultural products, increase access to China's markets by foreign producers of some commodities through tariff rate quotas (TRQs), and removes quantitative restrictions on others. In return, China is supposed to gain better access to foreign markets for its agricultural products, as well as a number of other indirect benefits. Domestic support and export subsidies are the other two critical issues that arose during the course of negotiations. Together with a number of other market-access commitments make China's WTO accession unique among all other developing countries that have been admitted to the WTO's new environment.

The import market access commitments that China has made to WTO members appear to be substantial. Overall agricultural import tariffs (in terms of its simple average) declines from about 21% in 2001 to 17% by 2004. The simple average agricultural import tariff reduced from 42.2% in 1992 to 23.6% in 1998 (MOFTEC, 2001). Although important, when taken in the context of the discussion in the previous section about China's external economy reforms of the last two decades, one would have to conclude that the commitments are merely an extension of China's past changes. WTO in this way can be thought of as just another step on China's road to opening up its economy.

With a few exceptions (e.g., in the case of several "national strategic products"), most of agricultural products will become part of a tariff-only regime. According to this part of the agreement, all non-tariff barriers and licensing and quota processes will be eliminated. For most commodities in this group, effective protection will fall substantially by January 2002 and fall even further by 2004 (Table 5). To the extent that tariffs are binding for some of these commodities, the reductions in tariff rates should stimulate new imports.

It is important to note, however, that although published tariff rates will fall on all of these commodities, imports will not necessarily grow summarily. Indeed, for many products, China has comparative advantages in many commodities presented in Table 5. For example, lower tariffs on horticultural and meats might impact only a small portion of domestic market

(e.g., those parts of the market that buy and sell only very high quality products—meats for five-star hotels that cater to foreigners). Although tariffs fall for all products, since China produces and exports many commodities at below world market prices, the decreases will not affect producers or traders.

Hence, the real challenge for agricultural products with tariff-only protection will be for crops such as barley, wine, and dairy products. In order to attempt to understand what may happen for some of these crops, it is instructive to examine the case of soybeans. In this case, producers in China clearly did not have a comparative advantage. Before 2000, the import tariff for soybeans was as high as 114%, importers required licenses, and China's farmers grew most of the nation's soybeans. However, in anticipation of the China's WTO accession, tariffs were lowered to 3% in 2000. After this lowering, officials also phased out import quotas. Consequently, imports surged from 4.32 million metric tons (mmt) in 1999 to 10.42 mmt in 2000. In 2001, most observers believe soybean imports exceeded 14 mmt. Prices also fell and the nominal protection rates of soybean declined from 44% in the early 2000 (Table 3) to less than 15% in October 2001 (Huang and Rozelle, 2001). From this case it is possible to see that when the protection rates are high and there is high demand for a commodity, imports can move up sharply.

Such movements, however, can be limited for a class of commodities called "national strategic products." China's WTO agreement allows officials to manage trade of rice, wheat, maize, edible oils, sugar, cotton and wool with tariff rate quotas (TRQs). These commodities are covered under a special set of institutions. As shown in Table 6, except for sugar (20%) and edible oils (9%), the in-quota tariff is only 1% for rice, wheat, maize, and wool. However, the amount brought in at these tariff levels is strictly restricted. For example, in 2002, the first 8.45 mmt of wheat will come in at a tariff rate of 1%. The in-quota volumes, however, are to grow over a three year period (2002 to 2004) at annual rates ranging from 4% to 19%. For example,

maize TRQ volumes increase from 5.70 mmt tons in 2002 to 7.20 mmt in 2004. China does not have to bring in this quantity, but provisions are in place that there is supposed to be competition in the import market so if there is demand inside China for the national strategic products at international prices, traders will be able to bring in the commodity up to the TRQ level.

At the same time, there are still ways theoretically to import these commodities after the TRQ is filled. Most poignantly, tariffs on out-of-quota sales (that is above 7.20 mmt in 2004 for maize) will drop substantially in the first year of accession and fall further between 2002 and 2005. If the international price of maize were to fall more than 65% below China's price after 2004, any trader is allowed to import maize. But, during the transition period, most people believe such rates are so high (e.g., 65% for grains and sugar in 2004 and edible oils in 2005) that in the coming years they will not bind (Table 6).¹

After the first 4 to 5 years of accession, a number of other changes will take place. For example, after 2006, China agreed to phased out its TRQ for edible oils. State trading monopolies also will be phased out for wools after 2004 and gradually disappear for most of other agricultural products (Table 6). Although China National Cereals Oil and Foodstuffs Import & Export Co. will continue to play an important role in rice, wheat and maize, there will be an increasing degree of competition from private firms in the importing and exporting of the grains in the future.

In its commitments to WTO accession, China also agreed to a number of other items, some of which are special to the case of China. First, China must phase out all export subsidies and not to introduce any these subsidies on agricultural products in the future. Moreover, despite clearly being a developing country, China's *de minimis* exemption for product-specific support is equivalent to only 8.5% of the total value of production of a basic agricultural product

¹ Although 65% above tariff rates seem high, it is important to note that in fact when compared to other countries, this is low. Most Asian countries that have a TRQ system, high tariff bindings that are 2 or more times higher than this.

(compared with 10% for other developing countries). Moreover, some measures, such as investment subsidies for all farmers and input subsidies for the poor and other resource-scarce farmers, that are generally available for policy makers to use in developing countries, are not allowed in China (i.e., China must include any such support as part of its aggregate measurement of support which should be less than 8.5 percent of agricultural output values).

Because of its Socialist background and the difficulty that the world has had in assessing the scope of the government's intervention into business dealings of all types, China agreed to a series of measure governing the way that they will deal with the rest of the world in cases of anti-dumping and countervailing duties. Most simply, special anti-dumping provisions will remain for 15 years. According to these provisions, in cases of anti-dumping China will subject to a different set of rules that countries can use to prove their dumping allegations. In addition, the methods that countries can use against China to enforce anti-dumping claims when they have won will differ from most of the world. In essence, this set of measures makes it easier for countries to bring, prove and enforce dumping cases against China. It should be noted, however, that although the rules differ from those governing trade among other countries, China will get the same rights in their dealings with other countries, a element that could help them in some cases with their dealings with dumping matters when they concern their partners' exporting behavior.

China's WTO commitments and privileges associated with the measures in other parts of the agreement also will directly or indirectly affect its agriculture. For example, on agricultural chemicals, China has committed to replace quantitative import restrictions on three types of fertilizers (DAP, NPK and urea) by TRQs. Tariffs will be cut on accession and further cuts will be phased in by 2005 in almost all industrial products, (e.g., tractors and pesticides). Furthermore, China will reduce significantly its non-tariff measures and eliminate all quotas,

tendering and import licensing on non-farm merchandise by no later than 2005. For textiles and clothing, however, the current 'voluntary' export restraints will not be completely phased out until end of 2008, meaning that the expansion of exports may not expand as fast as they would under a less restrictive regime. Substantial commitments to open up services markets in China also have been made.

Recent policy shifts and likely changes as a result of accession to WTO

While substantial institutional and marketing reforms implemented in agriculture since the late 1970s will help facilitate the response of households to the changes that will arise with the implementation of WTO and, more generally in China's overall transition to the post accession WTO regime, China still requires considerable reform to meet its WTO membership commitments (Martin, 2002). In fact, the government has realized for a considerable time that it faces a real challenge. In fact, in many instances, officials are taking this challenge as an opportunity to stimulate and accelerate its on-going reforms in both international and domestic policies.

Policy responses as a result of WTO accession are expected take one of two forms. One is a policy response that is required of China in order for it to be able to keep the nation's commitments and to adjust its domestic policies to be consistent with those promulgated by the WTO's rules. The other is a response that will consist of introducing some new set of measures that are allowed under the new framework that could help to boost China's economy and minimize adverse shocks that arise as part of the accession. Identifying the two kinds of policy changes is essential to study how China's WTO accession will affect the ways that policy makers respond after accession.

Legal and Legislation Changes

Many of the most important changes that will occur because of WTO will be in the area of legal and legislation changes. China reserves the right to use a transitional period of one year from the date of accession to amend or repeal any institution, regulation, law or legal stipulation in its current economic policies in order to make them consistent with the spirits of non-discrimination and transparency. The government recognizes this and has already started to make a concentrated effort to rectify existing legal rules and legislation in the late 1990s.

To provide a general guidance for ministerial and local government authorities to amend or repeal the relevant regulations, laws and policies, the State Council decreed two important Regulations in January 2002: the Regulations on Formulation Process of Laws; and the Regulations on Formulation Process of Administrative Laws. Essentially, a guide for local governments and ministries, these new regulations were issued with the aim of transferring many government functions toward the market and directing the government to take a more regulatory, indirect role in commerce and trade. It tries to limit the role of government and emphasizes that the role of government is primarily one to provide social and public services. The regulations also seek to simplify administrative processes and increasing the transparency of regulations and policies.

The effort to create and implement this new regulatory framework is widespread. For example, during the last stage of WTO negotiation, each ministry formed its leading group or committee to work on all of the laws and regulations under its jurisdiction. These committees typically were comprised of decision makers and experts who had the mandate of cleaning up all existing regulations and preparing a proposal for amending or repealing those laws and regulations that are not consistent with the WTO rules and China's commitments to its WTO accession. Local governments also had similar committees. Ministries and provincial government are also working closely with its corresponding law and regulation committee under

the Standing Committee of the National People's Congress for those laws and regulations to be amended or repealed by the People's Congress.

Several recent experiences involving amending laws and regulations and creating new institutions related to agriculture demonstrate the effectiveness of these committees and China's overall commitment to its WTO obligations. For example, China's Patent Law (which was originally issued in 1984 and then amended in 1992) was re-amended on July 1, 2001. Many of the associated regulations also were redone. Moreover, a new set of regulations on Plant Variety Protection (PVP) was put into effect in 1999 when China became the 39th member country of UPOV. Soon after passage, government agencies quickly proposed and implemented detailed regulations facilitating the implementation of PVP. The MOA and State Forest Bureau also created a new set of institutions, a series of Plant New Variety Protection Offices. Finally, China's Seed Law was issued in 2000. Hence, the rights of new plant varieties are now protected by both the PVP and Seed Law. To assist in the initial implementation of these laws the government has set up an IPR Affairs Center under the Ministry of Science and Technology.

In order to fulfill its legal obligations related to agriculture, MOA also has repealed several regulations since 2000 that sought to subsidize certain types of enterprises and apply different rules in agricultural input industries to different economic actors. Officials have eliminated the Regulations on the Development of Integrated Agricultural, Industrial and Commercial Enterprises under State Farms (issued in 1983 to assist in the development of state-owned farms) and the Regulations on the Development of Rural Township and Village Owned Enterprises (issued in 1979 to assist collectively-owned enterprises). Seed Management Regulations that gave monopoly powers to local seed companies and Pesticide Field Trial Rules that discriminated against foreign companies were abolished.

Despite the above substantial efforts, China still requires considerable institutional reform. There are still a number of laws and rules that treat domestic and foreign companies and

individuals differently. These changes still need to be changed to allow China to fulfill the legal obligations that they are committed in its Protocol of Accession to WTO. It may be even a greater challenge to build up the nation's capacity for effective implementation of the amended and new laws.

Agriculture Trade Reforms

Reforms and liberalization in China's trade laws and regulations are perhaps the most advanced, in part, because of its strategic role in the economy (Lardy, 2001). Through nearly 20 years reform, China's foreign trade regime has gradually changed from a highly centralized, planned and import substitution regime to a more decentralized, market-oriented and export promotion one (Huang and Chen, 1999). These changes in trade and other policies have significantly affected the total and composition of China's trade in favor of the products in which China has a comparative advantage. On the other hand, as argued by Martin (2002), while China's trade policies in most areas have been transformed in the reform era, trade in many agricultural goods remains under relatively non-transparent state trading arrangements. Accession to the WTO will be a critical time for China to push its trade reform in agricultural sector, including both tariff and non-tariff measures.

Changes in tariff policy are more straightforward and simpler than non-tariff policy reforms. China followed its tariff reduction schedule specified in the Protocol on the first day of 2002. Average tariff rate was reduced from 15.3% in 2001 to 12%. For agricultural products the tariff reduction was from 21% to 15.8%. China has also started to implement its three years of transition of progressively liberalize the scope and availability of trading rights for agricultural products as discussed in the last section. Export subsidies have been ordered to be completely phased out on the first day of 2002.

Compared to the trend of tariff reduction in the past decade, the tariff changes due to China's WTO accession should present relatively few problems. Significant reforms will,

however, be required in the area of non-tariff measures. Among various aspects of non-tariff barriers, state trading could be a particular important area to consider when reforming China's agricultural trade policy. China has agreed to phase out restrictions on trading rights for all products except those under TRQ trade regime that will implement a more gradual approach in phasing out the state-trading regime (Table 6). After three years of WTO accession, the private sector is supposed to dominate the trade of almost all agricultural products. There are provisions to keep the state involved in three commodities, however: wheat, maize and tobacco.

The measures for Technical barriers to trade (TBT) and sanitary and phy-sanitary (SPS) as well as institutional arrangements to fulfill the agreement on Trade-Related Intellectual Property Rights (TRIPS) are the other important issues which China has to deal with. The Agreements on TBT and SPS focus on using internationally accepted standards to discipline the use of standards as protectionist devices. This rules-based approach can be valuable in improving policy formulation, but is likely to require investment in strengthening standards-related institutions. Comprehensive adoption of these measures should lead to improved policies and, by basing policies on a scientific approach, move away from the time-consuming and inefficient approach of resolving these issues on a political basis.

China will undoubtedly struggle in its effort to create a fully transparent and open trade regime with respect to non-tariff barriers. The case of labeling requirements for GMO imports, most conspicuously soybeans, shows how frustrating and protracted the creation of any set of regulations and institutions can be. In June 2001, the government suddenly announced that in response to concerns about the presences of GMO foods in the nation's import basket, it would require that all goods contained GMOs from there on out would require labeling. Unfortunately, no one in the world who was shipping to China had a system in place to do so. China did not tell any one what was the process to apply for a permit for importing labeled commodities or the place to learn about the process. Initially, trade in soybeans was thrown into disarray. China's

traders lost money, soybean users faced tremendous losses, and prices threatened to rise sharply. Even when facing such a crisis, there was no way that any agency could clarify the matter or announce a plan. Instead, the government postponed any decision to an unspecified future date and trade has since continued.² The point of this is, however, that even when there is a crisis facing the external sector is often difficult to rapidly come up with effective and transparent regulations and implementing processes.

Domestic Market Reform and Infrastructure Development

After 20 years of reform, China's agriculture has become much more market-oriented (deBrauw et al., 2001). Traders moved products around the country with increasingly regularity and factors adjusted more rapidly. By the late 1990s, only grain, cotton, and to some extent silkworm cocoon and tobacco, were subjected to price interventions. But even in these cases, their markets, especially those for grain, have been shown to have become increasingly competitive, integrated and efficient overtime (Huang and Rozelle, 2001; Park, et al, forthcoming).

Despite the gains in market performance in recent years, WTO makes demands on China's domestic agricultural markets. Domestic marketing policy response to the nation's impending WTO accession has been substantial and will continue. Major changes are aimed at improving the efficiency of domestic market performance and minimizing the adverse shocks that may arise from external trade liberalization. Perhaps more than in any other sector, the reforms in cotton and grain markets that China agreed to in the final stages of China's WTO negotiation clearly show that its leaders are using this opportunity to develop its health domestic agricultural market.

The case of cotton presents a good example. In 1999, officials began experimenting in the North China Plain with marketing reforms for cotton, frequently considered the second most

² But in the early January 2002, the Ministry of Agriculture announced that the regulations for labeling on GMOs

important strategic agricultural commodity (because of its importance to the textile industry). The reforms were aimed at improving cotton market performance by reducing market transaction costs, creating a market-oriented pricing mechanism, and integrating regional markets. The main policy measure sought to eliminate the current monopolized state-owned cotton procurement and distribution system. In part reflecting the fact that informal markets had already been working for many years, the disruption to cotton markets after liberalization were almost non-existent. With a successful performance of this experimental reform, the liberalization policy was expanded substantially in 2000 and fully implemented in 2001.

Recent initiatives in grain market reform also appear to be particularly encouraging. Domestically, over the past two decades state-owned grain traders have chronically performed poorly due to imperfect incentives and a number of taxing policy burdens. Although many companies have received considerable marketing subsidies, the losses of these firms have always been a burden on the national leaders. Moreover, although it had appeared reformers had solved this problem in the mid-1990s, retrenchments in agricultural policy created a situation in which many state-owned grain companies were still losing money in the late 1990s.

Internationally, there were also concerns over several commonly executed policies that are now being addressed. For example, WTO negotiators expressed their opinion that China's traditional ways of pricing agriculture were distorting. Others believe that the rights of state-owned grain trading enterprises to procure commodities from farmers under special access rights give certain domestic firms unfair access and violates national treatment principles of WTO.

Facing these pressures and concerns, China has launched a new set of reforms in the area of state grain marketing system in 2000. Building on past efforts to liberalize markets and continuing with the tradition of moving gradually, many believe that the measures included in this round are ultimately expected to have a defining influence on China's grain markets in the

years to come. As part of the first step, the restrictions on grain procurement for lower quality grains such as the early indica rice and maize in southern China, spring wheat in northern China, and all wheat in southern China were phased out in 2000. After the policy was set in place, any trader was allowed to buy or sell grain from any farmer or other trader at any time. Almost immediately this policy resulted in an adjustment in the structure of the cropping patterns in some regions. In the last several years, producers have begun planting varieties to improve grain quality. Many of these improvements will mean that to some extent China's farmers are in a more competitive position to produce and sell varieties that might otherwise come in from foreign sources, for example, high quality rice from Thailand or high quality wheat from Canada or the US.

With successful performance of grain "varietal" reform in 2000, leaders are now going to officially liberalize grain markets. Depending on the deregulation of all grain-related procurement and sales, leaders are first implementing their policies in a subset of grain-deficit, coastal provinces, Zhejiang, Jiangsu, Shanghai, Fujian, Guangdong, and Hainan. Currently, the government is planning to extend the implementation of the policies in all grain deficit provinces in 2002. As seen in the past, given such close ties between traders in surplus and deficit areas, such policies in deficit areas will almost certainly naturally envelope all of China.

In response to WTO accession, the government also has ambitious plans to increase investment in market infrastructure. Leaders see a need to establish an effective national marketing information network. Officials in the ministry of agriculture are attempting to standardize agricultural product quality and promote farm marketing. Some also have advocated the creation of agricultural technology associations. More generally, all of these moves are part of an effort by leaders to shift fiscal resources that used to be used to support China's expensive price subsidization schemes (including both domestic and international trade subsidies) to productivity-enhancing investments and marketing infrastructure improvements. The magnitude

of this policy response is highlighted by the fact that the total subsidies for price and market interventions reached 40.3 billion in 2000, about 4 percent of national fiscal budget, more than any components of government expenditure in agricultural and rural area (e.g., 23 billion was spent on subsidizing agricultural production; 35.9 billion on supporting administrative costs (shiyefei) of bureaucrats that manage China's agricultural policies, 93 billion on integrated agricultural development program, and 12.3 billion on poverty alleviation--CNSB, 2001). While not all of these funds were being used on distorting policies or non-productive administration, much of it was. If a good part of the funds is able to be redirected into more productive areas, there is a chance that the agricultural sector can be energized by this new windfall.

Land Use Policy, Farm Organization and Farm Enterprises

The policy implications of China's WTO accession on land use and farm organization also are hotly debated. Many of the concerns have arisen over the ability of China's small farms to be able to compete after trade liberalization. Although every farm household in China is endowed with land, the average farm size is small, and declining (from 0.56 hectares in 1980 to 0.45 hectares in 2000--NSBC, 2001). Leaders are pleased with the equity effects of the nation's distribution of land as it allays concerns about food security and poverty. Land fragmentation and the extremely small scale of farms, however, almost certainly will in some way constrain the growth of labor productivity on the farm and hold back farm income. The debate has centered on these issues: Some argue that farm size could be expanded and agricultural productivity could rise if policy makers were to advocate more secure land tenure arrangements. Others call for a continuation of policies that allow localities to periodically re-allocated land to the farmers in order to keep land in the hands of all rural residents.

Although most policy makers currently seem to favor more secure rights, they still are searching for complementary measures that will not forego all of the pro-equity benefits of the current land management regime. Land ownership in rural areas, by law, is collectively owned

by the village (about 300 households) or small group (*cunmin xiaozu*, with 15-30 households) and contracted to households (Brandt et al., 2002). One of the most important changes in recent years has been that the duration of the use contract was extended from 15 to 30 years. By 2000, about 98% of villages had amended their contract with farmers to reflect the longer set of use rights (MOA, 2001). Although some were concerned that household and village demographics and other policy pressures often induce local authorities to reallocate land prior to contract expiration, it has been shown that the area of this reallocated land has been minimal and the effect on investment behavior insignificant (Brandt et al., 2001).

With the issue of use rights, resolved, the government is now searching for a mechanism that permits the remaining full-time farmers to gain access additional cultivated land and increase their income and competitiveness. One of the main efforts revolves around the development of a new Rural Land Contract Law. The Standing Committee of the National People's Congress has drafted a law and the main body is expected to approve it in the near future. According to this law, although the property rights over the ownership of the land remains with the collective, the Law conveys almost all other rights to the contract holder that they would have under a private property system. In particular, the Law clarifies the rights for transfer and exchange of the contracted land, an element that may already be taking effect as researchers are finding increasing more land in China is rented in and out (Zhang et al., 2001). The new legislation also allows farmers to use contracted land for collateral to secure commercial loan. Part of the law also allows family members to inherit the land during the contracted period. The goal of this new set of policies is to encourage farmers to use their land to increase their farms and household short and long-run productivity.

Although quite controversial, the effort to increase China's agricultural productivity under trade liberalization also is made through the promotion of large farm enterprises. Many officials in the MOA consider this effort as one of important forces that may help to

restructuring China's agriculture, expand agricultural markets, and increase farmer income (MOA, 2001). Recently fiscal authorities have supported this effort by making grants and allowing tax reductions for the infrastructure investments of the farms. They also have provided large farms with credit subsidies for input procurement and the financing of their efforts to update their technology at all levels of the food chain (e.g., the procurement of equipment for food processing enterprises—MOA, 2001). As a result of China's WTO accession, the support in this area is expected to increase. However, more effort in the future is likely to shift to supplying services that are supposed to be provided by government in areas such as farm infrastructure development, technology adoption, and extension, rather than direct intervention and subsidy. As subsidies through agricultural investment and inputs in China are subject to WTO restrictions on Aggregate Market Support (AMS), it is not expected that the extent of these subsidies will restrict such support. China will be limited to its support of large farms to levels that do not exceed its *de minimis* level of AMS of 8.5%. However, it is much more likely that its ability to finance agricultural subsidies will be more binding than the WTO-imposed rules.

The other major attempt to increase farm productivity and agricultural competitiveness under trade liberalization is to promote the development of farmer organizations. The government has now officially cast its support for self-organized farmer groups that focus agricultural technology and marketing (MOA, 2001). At one time, the creation of farmer organization was a political sensitive issue. Leaders were concerned with the rise of any organization outside the government's authority. Such restrictions, however, caused a dilemma in reforming the nation's agricultural and rural economies. Policy makers also are aware that with the small scale of China's farms there are many increases in economic efficiency that might be gained by the creation of effective rural organizations and that if they were successful in raising incomes, there might be a rise in political stability.

It is on this basis, then, that leaders have now decided to allow the organization of China's 240 million farms. Letting these millions of small farmers competing in a market with globalization requires substantial institutional reforms on farm organization and provisions of government service such as technology extension and marketing information and quality controls. It will be in these areas that farmer organizations will be encouraged. In addition, these types of farm organizations that are supported by the government fall under WTO's "Green Box" categorization and investments to create such groups will not be counted as part of the nation's AMS measures.

Perhaps more than anything, the government is going to need these farmer organizations to lead the fight against the imposition of trade barriers on China's agricultural exports. Because China's producers have not been organized, when foreign countries, such as Japan, Korea, and the US have levied trade barriers, typically citing dumping. Even when such cases were based on questionable bases, China had no one who had an incentive or ability to contest the cases. Since China Provisions of anti-dumping (15 years) and safeguards measures (12 years) against China's products, such cases will not abate and the nation needs to have a way to protect the interest of those seeking to export.

Financial and Tax Reforms

The financial sector has reformed more slowly than some other sector, and government maintains strong control (Shen, 2001). Among the commitments regarding the banking sector, the Protocol requires China to open the country's financial markets in a step by step way. The liberalization must allow foreign competition across wider and wider regions and customer base. After a four years transition period, all regional restrictions will be removed and foreign banks will receive national non-discriminative treatment in the area of banking services. Specifically, restrictions on branch banking can not be imposed.

International experience shows that in the long run, increased foreign participation in the financial sector will have a positive effect on country's development as a whole. However, in the period immediately following its WTO accession and the removal of protective measures in the financial sector, China may face one of its biggest challenges. There is a good possibility that the nation's banks will suffer financially. Hence, it might be expected, the leader's policy response to reform the current banking system will be a strong one. For example, financial sector officials are already mandating the government interventions fall, state banks recapitalize themselves, and nonperforming loans be transferred to asset management companies (Ma, 2001).

The implications of the above shifts of policies for agricultural development are not clear. While one might think the agricultural sector and poor regions in the rural economy could suffer from liberalization, it is not clear if things will be worse than before the reforms. In the past, agriculture in China was squeezed. Huang and Ma (1998) have shown how the financial sector has systematically shifted funds away from farming. Throughout the entire reform period, there was a net capital outflow by means of the financial system. Hence, it is hard to see how a reformed banking sector will treat agriculture any worse. Though, the experience of other countries most likely mean that in the short run small, poor farmers will be rationed out of financial markets.

Tax reform also is underway. In 2001, there were three major types of taxes levied on products and services: (a) a VAT levied on goods and services for processing, maintenance and assembling; (b) a Consumption Tax levied on some selected consumer products; and (c) a Business Tax on services and the sales transaction involving assets (for example, land). Both the VAT and Consumption Tax are applied to imported goods. Tax laws, however, have offered producers several exemptions. In many cases, part or all of the VAT is reimbursed when the goods is exported. All goods to be exported are not subject to the Consumption Tax. Although

subject to a number of technicalities, there is some concerns are some of these tax rebates may not be consistent with the requirements of the 1994 GATT rules. Since, China has agreed that it would ensure that its laws, regulations and other measures relating to internal taxes would be in full conformity with its WTO obligations, some adjustments may have to be made.

Perhaps the best example of this may be in the area of the assessment of the VAT on agricultural imports and the possibility that such an act may violate the national treatment clauses of the WTO accession agreement. Specifically, while the VAT is charged in full at the border for all imports (e.g., the soybean importer must pay a 13 percent VAT tax as the shipment enters the country, the VAT is not assessed on farmers when the trader procures the crop at the farm gate or in the local market. The tax is assessed on any subsequent transactions. For example, when the trader who bought the grain from the farmer sells it to a buyer a some point down the marketing chain, she is assessed the VAT on the marketing margin that was earned (so, if the marketing margin, or the difference between the buy and sell price was 5 percent, the trader would pay 13 percent of 5 percent, so the tax based on the total value of the crop would only be around 1 percent). Although some observers in China have tried to argue that since farmers in rural areas already pay high land- and head-taxes, they can fairly be exempt, such a tax is not commodity specific and such unequal taxation of imports and domestically procured crops almost certainly violates WTO. If such a tax policy is challenged, China will have two options: assess the VAT on all domestic procurement or eliminate the VAT at the border on agricultural goods.

More generally, as China attempts to make it economy more competitive in a post accession world, it has announced that in some areas it will lower taxes. The primary objective would be to lower the burden of domestic enterprises and attract new foreign investment. Tax cuts would also increase the competitiveness of its domestic products in the international markets. Moreover, tax officials also have plans to continue to push on tax reform that shift

China from a system that primarily uses a production-based tax system to a more consumer-oriented tax regime. While desirable, it should be noted that the timing of implementing this tax reduction necessarily will depend on the impacts that the reform would have on the government's revenue-earning capacity. An official from the State Council recently claimed that a major move to realign China's tax system towards a more consumer-oriented one may begin as soon as 2003.

To make the rural economy more competitive and to remove a set of institutions that have historically caused a lot of frustration among rural residents, officials have also begun to experiment with rural tax reform. The most bold experiment to date is based on a movement that seeks to "convert fees into taxes." The earlier experiments began in Anhui province in 2000. The reform was implemented to reduce the burden of various fees imposed on farmers to a maximum level of 5 percent of the income of farmers. By reducing the tax burden of the farmer, officials hope to reduce the cost of agricultural production, since many fees are collected from farmers by local government and village committee on the basis of their sown area or level of livestock production. Originally, it was planned to extend this reform from Anhui to the rest of China within several years after the start of the experiment. The State Council hoped to spread Anhui's rural tax reform in one third of all provinces in 2002. However, recent problems with the system have appeared in Anhui. Although fees and taxes have been reduced, the fall in local revenues have limited the ability of the local government to implement a number of basic mandated expenditures, including the support of schools, health systems, and basic infrastructure maintenance. Recent government pronouncements have actually put the Anhui experiment on hold. It is likely that successful implementation of such a policy will require substantial reforms in other areas (such as rural education reform) and a basic change in the way that government fiscal resources are shifted to poor areas to support basic services.

Agricultural Investment and Supporting Policies

In one of its most fundamental concessions (since most countries are not required to on the basis of their own WTO protocols), China agreed to phase out its export subsidies in the first year of WTO accession. Such subsidies have played considerable roles in assisting with the export of maize, cotton, and other agricultural products into international markets and in this way indirectly supporting domestic prices. In fact, after phasing out export subsidies, several of China's sectors (e.g., maize and cotton) will likely be subject to much intensive competition from imports.

Besides the elimination of export subsidies—which are “Red Box” investments, WTO also puts strict controls on the types and amounts of certain investments. In particular, domestic support to agriculture is divided into “Green Box” and “Amber Box” ones. As is the case with other WTO members, China faces no limitations in the amount that the nation can invest into those activities classified as Green Box, but face carefully circumscribed rules regarding the amount that can be invested into those activities listed as Amber Box policy. Hence, WTO will most likely force China to shift the composition of their investment portfolio.

In planning their Amber Box investments, China accession protocol allows a *de minimis* level of investment that is equal to 8.5 percent of agricultural gross value product. After intense negotiations this level was set somewhat below that enjoyed by other developing countries (10 percent) but above that allowed to developed countries (5 percent). Moreover, the list of items that are used to in the computation of China's AMS is wider than that used by other countries. For example, certain investment subsidies are not counted in the computation of AMS in developing countries. Developing countries also frequently can classify input subsidies for poor farmers as Green Box investments. Hence, on paper, China's hands appear to be quite firmly tied in the scope of the investments that they are able to make after their WTO accession. However, when one begins to add up the amount of fiscal funds that China has historically

invested in these areas, it may be that the *de minimis* limits will not be binding.³ The biggest impact could be sometime in the future after China grew and its budget constraint was somewhat relaxed. At that time, however, China's agreement should be thought of as fairly limiting as it closes future options to support its rural areas in ways that its neighbors in East Asia have done (Martin, 2001).

In a post-WTO environment, China's leaders will give more thought to how it can best use its *de minimis* budget. Most recently, a study by Huang and Rozelle (2001) shows that although most labor intensive agricultural commodities, such as livestock and horticulture, had negative NPRs in late 2001, the time just prior to China's WTO accession, many land intensive products, including maize, wheat, oilseed crops and sugar, had NPRs ranging from 5 to 40 percent. Moreover, the crops with the positive NPRs are almost all under TQR management, a finding that has important implications how China may want to use its scarce AMS funds. Instead of continuing to support or subsidize these products, China may want to promote these crop productions through productivity enhanced investment measures, such as more agricultural research or transportation and communication investments. Since many of such investments have long gestation periods, the sooner leaders make the investments, the smaller the shock will be after China's TQR management regime is removed.

Although there are no limits on Green Box investments, fiscal constraints will make it so leaders must carefully allocate its investment into non-distorting productivity-enhancing activities. Recent increases in the government's support to enhance agricultural productivity growth indicate that China already has begun to respond to the challenges posed to China under the WTO regime and believes that investment-enhancing investments will play an important role

³ Cheng (2000) shows that China's AMS in the entire period of 1990s was negative. Ma (2001) claims the subsidies provided by government to agriculture from production to consumption and marketing were less than 2.3% of agricultural output in 1999. It is worth to note that most of these subsidies were gone to maintain an expensive domestic grain and cotton quota procurement system and export subsidies for maize and cotton, the former is in phasing out period now and the later has been removed since 1 January 2002. Even the limit of AMS

in making China's farmers competitive. For example, total agricultural research expenditures (those by allocated through government budgetary channels and those contributed from the commercial revenues generated by institute's business activities) in real terms grew annually at more than 10 percent. Growth of these expenditures has grown during the late 1990s (Huang and Hu, 2002). Moreover, China currently considers agricultural biotechnology as one of the primary measures to improve its national food security, raise agricultural productivity, and create its competitive position in international agricultural markets. Public agricultural research investment in plant biotechnology has increased at a rate even faster than the rest of the research sectors (Huang et al., 2002).

However, despite the growth in spending on agricultural research, investment intensity was only 0.44 percent in 1999, one of the lowest levels in the world (Huang and Hu, 2002). Much more needs to be done.

Complementary investments are also needed. For example, financing agricultural technology extension is even more problematic (Qian, 2000). During China's reform period, the expansion of the output of agricultural production due to the increased incentives from decollectivization ranks as one of the nation's great achievements, though a significant portion of that gain arose from the mobilization of inputs. China's future agricultural production increases, however, may not be able to rely on inputs as much as in the past. Other correlates of development, such as rising wage rates, environmental awareness, resource limitations, and recent China's WTO accession, mean that there will be pressure on farmers to reduce input use and their production costs. As the nation's farmers near input plateaus, further growth in output must begin to rely more on technological change and systems must be in place to generate the technology and extend it to farmers.

The nation needs to continue its recent trends of investment into rural infrastructure. Over the past several decades, tremendous improvements have been made in areas such as transportation, irrigation, and flood control. These projects should be continued in the future. Recent decisions to improve marketing infrastructure, including attempts to set up market and price reporting information and the standardization of agricultural product, are moving the emphasis of officials in the right direction. In other words, it is exactly these types of investments that the government is supposed to and is capable of making. These are all Green Box policies, meaning there is no limit to the support China can give its domestic agriculture through such productivity-enhancing investments. Such investments may have a number of indirect effects, also. A better environment for China's producers mean that investors, both domestic and from abroad may be will to transfer in better technology.

The government should also invest in the activities that will help promote the import of technology and investment. In some case, productivity-enhancing technology can be more easily obtained by importing new technologies and inputs. In the WTO environment, opportunities exist to reduce the barriers that have been keeping China's farmers from having access to the lowest cost technology in the world. Restrictions on the imports of seed, pesticides and herbicides and barriers keeping out foreign direct investment in the agricultural input sector should be expected to be gradually removed.

Agricultural Structure Adjustment and Macro-policies

Agricultural structure adjustment was considered as the central policy goal of the government in 2000 and further emphasized in 2001. This adjustment includes structure changes among agricultural commodities, quality improvement of China's major commodities, and the promotion of regional specialization. These new policy efforts, in part taken as part of China's effort to prepare for WTO membership, is called the "Strategic Adjustment of Agricultural Structure" (MOA, 2000). Key policies and measures to support these adjustments include many

of the actions discussed above. The nation's leaders believe that if they re-initiate grain marketing reforms, redirect part of the government's resource allocation from grain and cotton staples toward commodities in which they have a comparative advantage, such as horticulture crops, and the promotion of regional specialization. To do so, the focus of leaders is also new. They plan on relying more on technology improvement, investments in infrastructure, and setting up an environment in which local agricultural enterprises and integrated agricultural production and marketing can occur.

Although out of control of those who are directly in charge of agriculture, there are a number of policies that can complement the structural transformation of agriculture and which will serve to make China more competitive in its post-WTO environment. For example, ultimately, agricultural producer must dramatically increase the scale of their operation. But, this will not occur until massive amounts of labor shift into the off-farm sector, in general, and into urban areas, in particular. Hence, policies that promote labor movement will also be good for agricultural income and production. While a complete discussion is beyond the scope of this paper, national leaders need to promote employment policies that will help lead to more urbanization (such as eliminating or revising the hukou system), promote rural township development (by providing localities with the tools to launch effective small town development (though this should preferably be done with local resources since it is almost impossible for upper level leaders to choose "winners), and labor market development (by removing the constraints to small enterprise expansion in rural areas, encouraging the expansion of rural firms that are organized on a profit-oriented motive.

Conclusions

In this paper we have attempted to meet three objectives. First, we briefly review China's existing agriculture policy and past performance of China's agriculture and how it has changed during the past 20 years of reform. Next, we examine the main features of the agreement that China must adhere to as they enter WTO. Finally, we consider a number of possible ways that policy makers may respond, primarily focusing on the national government's viewpoint.

One of the most important finding of the paper, we believe, is that China, contrary to the criticism of some, have already started preparing itself to adjust to the environment of a post-WTO regime. Tariffs have come down, many laws have been amended, investment baskets shifted, and policy strategies have already changed to help China meet its commitment and help it farmers take on a new role. That is not to say that the job is over. Far from it. But, the strides that the government has taken so far both show it understands the role the government must play after membership in WTO and is committed to living up to its obligations.

Another finding of importance that falls out of the discussion in this section, is that in fact that government has many options at its disposal. Even despite the fact that the WTO protocol that China has agreed to imposes some of the severest restrictions on their actions of any country that is a part of WTO, China's leaders can still play an active role in helping its farming sectors. Some of the most obvious and important activities will be to increase investment in productivity-enhancing investments that are not limited by WTO, those such as expenditure on agricultural research, road construction, or the setting up of nation-wide information networks. Even after these investments, China still will have some latitude, fiscal resource constraints notwithstanding, to use to promote strategic sectors. Since the expansion of those areas that China has a comparative advantage in – areas such as horticulture, fruit,

livestock and aquaculture – will have the greatest chance at succeeding and contributing to farmer income in a post WTO world, the limited AMS funds should be spent on supporting the right sectors.

Most fundamentally, the government's response to WTO really involves an entire shift of paradigm – from participation in the economy directly to taking on a more indirect regulatory and fostering role. The government needs to set up institutions that allow them to effectively create and manage public goods. They need to regulate markets to correct for natural market failures. They need to do the things that the private sector is not willing to do and to do those things that will enhance the productivity of the nation's economic actors. They also need to begin to move away from an attitude that China's own producers need to produce everything in China and set up an environment that foreign firms are anxious to invest in and into which they are willing to bring their best technology and management practices. This is what free trade is supposed to do. Only an effective, bold, and multi-faceted government policy can let China take maximum advantage of the benefits and minimize the costs of adverse consequences that will definitely arise

Reference

- Anderson, K. and C.Y. Peng. 1998. "Feeding and Fueling China in the 21st Century", *World Development* 26(8): 1413-29, August.
- Brandt, L., J. Huang, G. Li and S. Rozelle. 2001. "Land Rights in China: Facts, Fictions, and Issues," *China's Economic Review*, (forthcoming).
- Brown, L.R. 1995. *Who Will Feed China? Wake-up Call for a Small Planet*, New York: W.W. Norton.
- Brandt, L., J. Huang, G. Li and S. Rozelle. 2001. "Land Rights in China: Facts, Fictions, and Issues," *China Economic Review*, (forthcoming).
- Carter, C.A. and A. Estrin (2001), "China's Trade Integration and Impacts on Factor Markets", mimeo, University of California, Davis, January.
- Cheng, G. 2000. *Impacts of WTO Agreement on Agriculture on China's Agricultural Development*. China's Economic Press, Beijing.
- Colby, H. 2001. "Agricultural Trade and Investment Liberalization after China's Accession to WTO. OECD Working Paper, Paris, France.
- deBrauw, A., J. Huang and S. Rozelle. 2001. "Sequencing and the Success of Gradualism: Empirical Evidence from China's Agricultural Reform," Working Paper, Department of Agricultural and Resource Economics, University of California, Davis.
- de Brauw, A., J. Huang, S. Rozelle, L. Zhang and Y. Zhang. "The Evolution of China's Rural Labor Markets during the Reform," A Paper Presented at the Conference on the Transformation of China's Rural Economy, 7-8 June 2001, the University of Hongkong.
- Fan, S. and P. Pardey. 1997. "Research Productivity and Output Growth in Chinese Agriculture," *Journal of Development Economics* Vol.53(June 1997):115-137.
- Huang, J. 1998. "Evaluation of Current Three-grain-policy", CCAP's Working Paper WP-00-C01, Center for Chinese Agricultural Policy, Chinese Academy of Agricultural Sciences, Beijing.
- Huang, J. and H. Bouis. 1996. "Structural Changes in Demand for Food in Asia," IFPRI's Food, Agriculture, and the Environment 2020 Paper Series 11, 1996, International Food Policy Research Institute, Washington D.C.
- Huang, J. and C. Chen, 1999. Effects of Trade Liberalization on Agriculture in China: Institutional and Structural Aspects. United Nations ESCAP CGPRT Centre, Bogor, Indonesia.
- Huang, J. and H. Ma. 1998. "The 20-Year Reform and the Role of Agriculture in China: Capital Flow from Rural to Urban and from Agriculture to Industry," *Reform*, No.5, pp. 56-63.
- Huang, J. and R. Hu. 2002. Funding Options for Agriculture Research in the People's Republic of China. Project Report, Agricultural and Social Sector Department, Asian Development Bank. Manila.
- Huang, J. and S. Rozelle. 1996. "Technological Change: The Re-Discovery of the Engine of Productivity Growth in China's Rice Economy," *Journal of Development Economics*, Vol.49(1996):337-369.
- Huang, J. and S. Rozelle. 1998. "Market Development and Food Consumption in Rural China," *China Economic Review*, 9(1998):25-45.
- Huang, J. and S. Rozelle. 2001. "The Nature and Extent of Current Distortions to Agricultural Incentives in China", paper presented at the second project meeting on WTO Accession, Policy Reform and Poverty Reduction in China, World Bank Resident Mission, Beijing, 26-27 October.
- Huang, J., S. Rozelle, C. Pray, and Q. Wang. "Plant Biotechnology in the Developing World: The Case of China," *Science*. 25 January (2001).

- Huang, Jikun, Scott Rozelle, and Linxiu Zhang. 2000. "WTO and Agriculture: Radical Reforms or the Continuation of Gradual Transition", *China Economic Review*, 11(2000):397-401.
- Jin, S., J. Huang, S. Rozelle, and R. Hu "The Creation and Spread of Technology and Total Factor Productivity in China," *American Journal of Agricultural Economics*. Forthcoming.
- Kanbur, R. and X. Zhang. 2001. "Fifty Years of Regional Inequality in China: A Journey Through Evolution, Reform and Openness", CEPR Discussion Paper No. 2887, London: Centre for Economic Policy Research, July
- Lardy, N. R. 1995. "The Role of Foreign Trade and Investment in China's Economic Transition," *China Quarterly*, 144:1065-1082.
- Lardy, N. 2001. *Integrating China in the Global Economy*, Washington, D.C.: Brookings Institution.
- Li, S., F. Zhai and Z. Wang. Development Research Center, 1999. The Global and Domestic Impact of China Joining the World Trade Organization, A Project Report, Development Research Center, the State Council, China
- Lin, J. Y. 1991. "Prohibitions of Factor Market Exchanges and Technological Choice in Chinese Agriculture," *Journal of Development Studies* 27(4):1-15.
- Lohmar, B. 1999. "Rural Institutions and Labor Movement in China," Unpublished Ph.D. Dissertation, Department of Agricultural Economics, University of California, Davis.
- Lu, F. 1999. "Three Grain Surpluses: Evolution of China's Grain Price and Marketing Policies, 1978-1999", paper presented to the Symposium on China's Agricultural Trade and Policy: Issues, Analysis and Global Consequences, San Francisco, June 25-26, 1999.
- Martin, W.. 2002, "Implication of Reform and WTO Accession for China's Agricultural Policies", *Economies in Transition* (forthcoming).
- Ma, J. 2001. "China's Financial Liberalization Agenda," Global Market Research Report, May, 2001. Deutsche Bank Hong Kong.
- Ma, J. 2001. "Agriculture Subsidies: The Last Stumbling Block to China's Entry to the WTO?" Working Paper, Deutsche Bank Hong Kong.
- MOA [Ministry of Agriculture]. China Agricultural Development Report, 2000 and 2001. China's Agricultural Press, Beijing.
- NSBC [National Statistical Bureau of China], China Statistical Yearbook, various issues. China Statistical Press, Beijing.
- NSBC [National Statistical Bureau of China], China Foreign Economic Statistical Yearbook, various issues, China Statistical Press, Beijing.
- Nyberg, A. and S. Rozelle. 1999. Accelerating China's Rural Transformation. the World Bank, Washington DC.
- Rozelle, S. and J. Huang. 2001. "Impacts of Trade and Investment Liberalization Policy on China's Rural Economy", OECD Working Paper, Paris, France.
- Park, A., H. Jin, S. Rozelle and J. Huang. "Market Emergence and Transition: Transition Costs, Arbitrage, and Autarky in China's Grain Market," *American Journal of Agricultural Economics*. Forthcoming.
- Qian, Y. 2000. Agricultural Production and Agricultural Technology Extension in China. Unpublished MS thesis. Center for Chinese Agricultural Policy, Chinese Academy of Sciences, Beijing.
- Sicular, T. 1988. "Plan and Market in China's Agricultural Commerce", *Journal of Political Economy* 96(2): 383-87, April.
- Stone, B. 1988. "Developments in Agricultural technology," *China Quarterly*, 116 (December).

Table 1. The annual growth rates (%) of China's economy, 1970-2000.

	Pre-reform	Reform period		
	1970-78	1979-84	1985-95	1996-00
Gross domestic products	4.9	8.5	9.7	8.2
Agriculture	2.7	7.1	4.0	3.4
Industry	6.8	8.2	12.8	9.6
Service	Na	11.6	9.7	8.2
Foreign Trade	20.5	14.3	15.2	9.8
Import	21.7	12.7	13.4	9.5
Export	19.4	15.9	17.2	10.0
Grain production	2.8	4.7	1.7	0.03
Oil crops	2.1	14.9	4.4	5.6
Fruits	6.6	7.2	12.7	8.6
Red meats	4.4	9.1	8.8	6.5
Fishery	5.0	7.9	13.7	10.2
Rural enterprises output value	na	12.3	24.1	14.0
Population	1.80	1.40	1.37	0.90
Per capita GDP	3.1	7.1	8.3	7.1

Note: Figure for GDP in 1970-78 is the growth rate of national income in real term. Growth rates are computed using regression method. Growth rates of individual and groups of commodities are based on production data; sectoral growth rates refer to value added in real terms.

Source: SSB, Statistical Yearbook of China, various issues; MOA, Agricultural Yearbook of China, various issues.

Table 2. Changes in structure (%) of China's economy, 1970-2000.

	1970	1980	1985	1990	1995	2000
Share in GDP						
Agriculture	40	30	28	27	20	16
Industry	46	49	43	42	49	51
Services	13	21	29	31	31	33
Share in employment						
Agriculture	81	69	62	60	52	50
Industry	10	18	21	21	23	22.5
Services	9	13	17	19	25	27.5
Share in Export						
Primary Products	Na	50	51	26	14	10
Foods	Na	17	14	11	7	5
Share in Import						
Primary Products	Na	35	13	19	18	21
Foods	Na	15	4	6	5	2
Share in agricultural output						
Crop	82	76	69	65	58	56
Livestock	14	18	22	26	30	30
Fishery	2	2	3	5	8	11
Forestry	2	4	5	4	3	4
Share of rural population	83	81	76	74	71	64

Source: State Statistical Bureau, China Statistical Yearbook, various issues; and China Rural Statistical Yearbook, various issues.

Table 3. Nominal protection rates (NPR) for grain, China, 1978 to early 2000

	Quota procurement price				Negotiated procurement price				Wholesale market price			
	Rice	Wheat	Maize	Soy-bean	Rice	Wheat	Maize	Soy-bean	Rice	Wheat	Maize	Soy-bean
1978-79	-42	15	12	2	-6	72	65	22	10	89	92	40
1980-84	-43	-3	-15	13	2	50	28	25	9	58	46	44
1985-89	-30	4	-13	-13	-5	34	17	15	-4	52	37	39
1990-94	-37	-14	-35	-32	-16	14	-7	7	-7	30	12	26
1995-97	-23	-12	-14	-22	-4	6	3	8	-1	19	20	19
1998-00	-3	10	22	33	-16	9	19	39	-6	26	32	49
1998	2	16	33	8	-16	5	26	37	-6	22	40	37
1999	-6	22	30	53	-19	12	20	59	-9	30	33	67
2000	-4	-7	2	38	-13	9	11	21	-2	26	23	44

Note: Border prices are averages prices of exports (rice and some time maize) or imports (wheat, soybean and some time maize) for the varieties that are comparable with domestic grains. Data for 2000 are in the early 2000. Official exchange rates are used to converse border prices.

Source: Huang (2001).

Table 4: Nominal protection rates (NPR) for cotton and livestock products, China, 1997 to 1999

	Cotton	Pork	Beef	Chicken
1997	20	-19	-2	-34
1998	11	-25	-10	-37
1999	4	-17	24	-30
1997-99	12	-20	4	-33

Note: Export prices of pork, beef and chicken, and import prices of cotton are used as border prices. Domestic prices are prices at urban wholesale markets. The cotton wholesale price is estimated as the state procurement price times 1.25. Official exchange rates are used to converse border prices.

Source: Huang (2001).

Table 5. Import tariff rates on major agricultural products subject to tariff-only protection in China.

	Actual tariff rates in 2001	Effective as of 1 January 2002	2004
Barley	114 (3) ^a	3	3
Soybean	3 ^b	3	3
Citrus	40	20	12
Other fruits	30-40	13-20	10-13
Vegetables	30-50	13-29	10-15
Beef	45	23.2	12
Pork	20	18.4	12
Poultry meat	20	18.4	10
Dairy products	50	20-37	10-12
Wine	65	45	14
Tobacco	34	28	10

A: Barley was subjected to licence and import quota, the tariff rate was 3% for import within the quota and no above-quota barley with 114% tariff was imported in 2001.

b: Tariff rate was as high as 114% before 2000 and lowered to 3% in after the early of 2000.

Source: China's WTO *Protocol of Accession*, November 2001.

Table 6. China's market access commitments on farm products subject to tariff rate quotas.

	Import volume (MMT) (State trading share, %)			Quota growth (%pa)	In-quota tariff (%)	Out-of-quota tariff (%) (%, as of 1 January)		
	Actual 2000	Quota 2002	Quota 2004			2002	2003	2004
Rice	0.24 (100) ^a	3.76 (50)	5.32 (50)	19	1	74	71	65
Wheat	0.87 (100)	8.45 (90)	9.64 (90)	8	1	71	68	65
Maize	0.0 (100)	5.70 (67)	7.20 (60)	13	1	71	68	65
Cotton	0.05 (100)	0.82 (33)	0.89 (33)	5	1	54.4	47.2	40
Wool ^b	0.30	0.34	0.37	5	1	38	38	38
Edible oils ^c	1.79 (100)	5.69 (40)	6.81 (10)	15	9	75	71.7	68.3
Sugar ^d	0.64	1.68	1.95	8	20	90	72	50

a: Figures in parentheses are the share (%) of non-state trading in import quota.

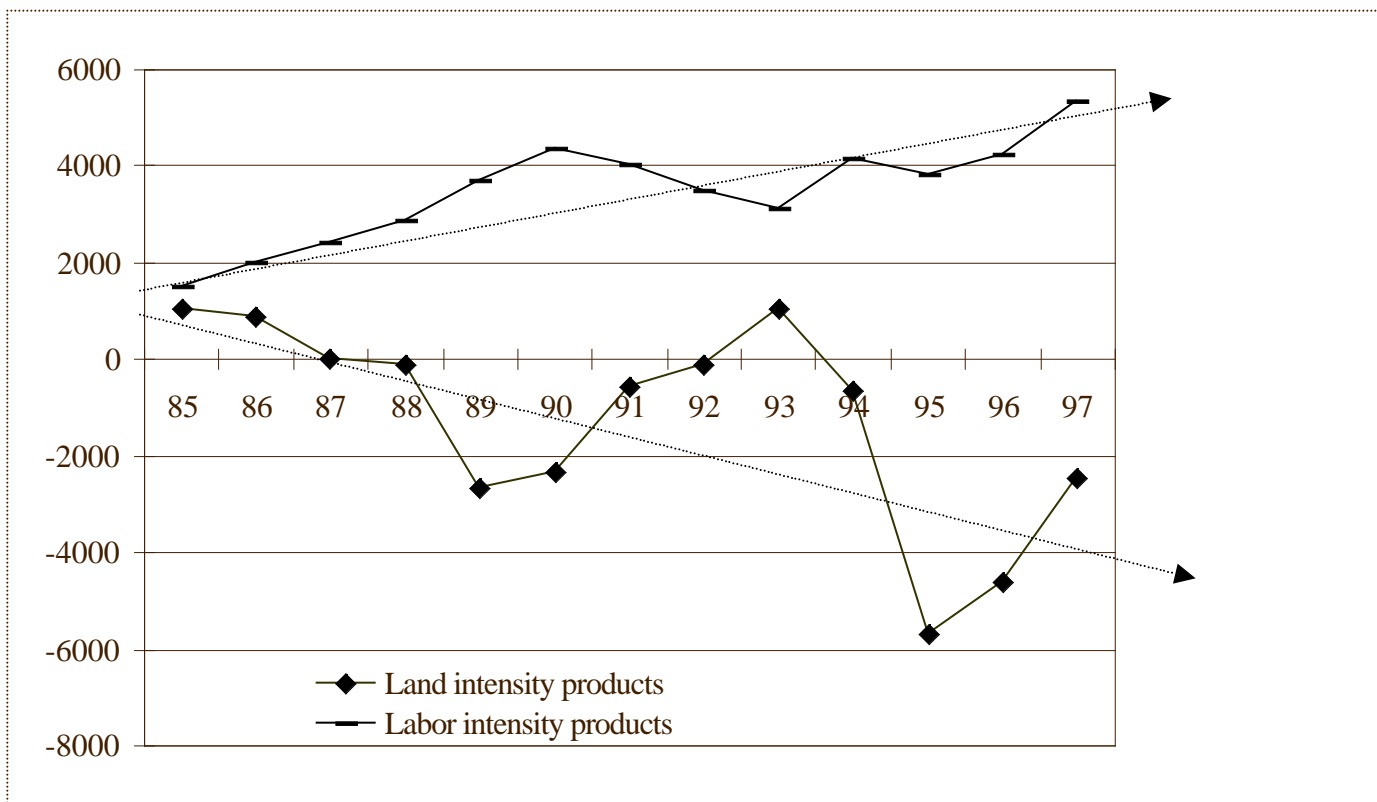
b: Designated trading in 2002-2004 and phased out thereafter.

c: TRQ regime will be phased out in 2006. In 2005, import quota will be 7.27 MMT with 9% in-quota tariff and 65% out-of-quota tariff.

d: Phased out quota for state trade.

Source: Schedule CLII of China's WTO *Protocol of Accession*, November 2001; Statistical Yearbook of China, 2001.

Figure 1. Agricultural trade balance by factor intensity (million US\$)



Source: Huang and Chen, 1999.