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Chapter 6:

Resource Mobility and China's Agricultural Trade Policy

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Chapter 6:**Resource Mobility and China's Agricultural Trade Policy*****Introduction***

Agricultural trade policy in China has been under re-assessment since China's accession to the WTO. Over the past decades, China has protected part of its agricultural sector through various policy instruments. Production support and border measures have been successful in promoting domestic agricultural production and protecting some producers from foreign competitors. However, such results have been achieved at the price of inefficient resource allocation and loss of trade benefits for the overall economy. After China joined the WTO, the question of whether the same set of trade policies should be carried out has been under heated discussion. Analysis from the point of view of comparative advantage and the benefits of free trade suggests a more open trade policy and increasing government support toward labor-intensive agricultural products (Huang et al., 2005; Zhong, 2003); whereas concerns from the view of food security and the future growth of agricultural production lead to a preference for policies towards strong protection, especially for land-intensive agricultural products such as grain.

In this chapter we attempt to provide analysis from another important perspective: resource mobility in agricultural production, and to argue that protection for sectors with low resource mobility is needed during a period of transition. At the same time, greater effort needs to be made to improve the mobility of these resources, which will lead to less trade protection in the future and more gains from trade.

Resource mobility is one of the important assumptions of trade theory. In the Ricardian and Heckscher–Ohlin models, free trade between two nations is always believed to bring mutual benefit to both parties, because it leads to specialization of production and more efficient resource allocation. Therefore, both nations' welfare will increase after an exchange of goods produced at lower costs. However, if some factors of production are assumed to be tied to a particular industry and are immobile, resources in the import-competing industry that cannot move will receive lower rates of return, as depicted in the specific-factor model.

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Agricultural production resources are less mobile compared to other industries. Relocation of resources may result in heavy losses, and there are long time-lags. High transaction costs may inhibit the transfer of welfare. Under such circumstances, the economic and social impacts of welfare changes, which result from freer trade, cannot be neglected. Support for protection is grounded in the time period required for structural adjustment.

The specific-factors model provides a very important and useful analytical framework for understanding the contradictions between conventional trade theory and practice. It has also been applied in many empirical research studies (Burgon, 2001; Brecher and Choudhri, 1994; Cassing and Ochs, 1978). However, the structure of the model as well as its application usually reflects the situation in developed countries, in particular the industrial sector, which is substantially different from the situation in the agricultural sector in developing countries such as China.

The specific-factors model contains three factors of production: labor, capital, and land. Labor is assumed to be a homogenous and mobile resource that can be used in either of two sectors, manufacturing and food production, whereas capital is assumed to be low in mobility. Labor is assumed to be mobile mainly because the time it takes labor to move between geographic locations is limited. One influential study found that when a US state hits economic difficulties, workers quickly begin leaving for other states, and within 6 years the unemployment rate falls back to the national average (Blanchard and Katz, 1992). Labor is generally classified as homogenous and can transfer from one sector to another. It is further assumed that workers who have received highly specific training (a minority of the labor force) are less mobile as compared to workers who have general skills (a majority of the labor force). Capital is assumed to be low in mobility because it is hard to change the use of large machinery equipment and even buildings: a lifetime of 15–20 years for a typical specialized machine and 50 years for office buildings are commonplace.

The situation is substantially different in the agricultural sector of developing countries: capital is more mobile than labor. There are few large-scale machines or production-specific capital investments. Capital investments for agricultural production are usually small, with production tools or equipment used for one kind of crop production applicable for other kinds of crop production as well. Labor movement, in contrast, is constrained by institutional, cultural, educational, ethical, traditional and other constraints, both in the case of intra-sector

and inter-sector movement (Cai, 2005) . Moreover, labor is not homogeneous and cannot transfer from the food to manufacturing sector as easily as in the case described in the specific-factors model. On the contrary, due to the lower level of education in rural areas, only a small group of farmers who are either better educated or trained are relatively mobile while the majority, having received a low level of education and training, are relatively immobile (Zhao, 1997).

There is another important difference between the agricultural sector of developed countries and that of developing countries, which deserves attention in policy discussions. In developed countries, the owners of land, capital and labor used in agricultural production, are usually not the same group of people. The immobility of one of two production resources (in the specific-factors model, the sector-specific physical assets), may hurt only that specific group of owners if an outside shock occurs. By contrast, in developing countries farmers are usually both the labor and capital supplier to their own land, that is, they are the owner of, and all of their profit comes from the return to, all three factors – land, labor and capital – in agricultural production. Therefore, farmers are more vulnerable and may be hurt in multifaceted ways by shocks in agricultural production. Compared to producers in developed countries, farmers in developing countries are not only a much larger group, but also are far more vulnerable because of their much lower and volatile income, and hence deserve more attention in policy analysis. It is, therefore, necessary to carry out further research that better reflects the situation and experience of the agricultural sector of developing countries. This chapter takes a preliminary step towards analyzing resource mobility in Chinese agriculture production, the constraints to mobility, and its implications for trade policies. The basic objective is to identify the rationale of protection in the short run and to establish alternative measures to improve resource mobility in the long run. Such measures aim to improve the welfare of farmers in China who face heavy pressures from free trade and globalization.

Resource Mobility in Chinese Agriculture

Various production resources are required in the agricultural sector: (1) natural resources such as land, climate, soil, and water; (2) capital inputs, such as machinery, seed, and fertilizer; (3) human resources, including the quantity and quality of agricultural labor; and (4) institutional arrangements such as government interventions in infrastructure that facilitate agricultural

production and marketing. Because of different constraints and barriers to movement, the mobility of these production resources varies widely across regions and production lines.

Natural Resources: Land is the most important resource in agricultural production. Unlike other industries, agricultural production, especially crop production, cannot be carried out without land. Land is physically fixed, and it is incapable of moving among regions. As a result, the productivity of land for a particular crop is subject to specific climate, topography, soil and water conditions attached to the location. Furthermore, as a productive input, land is also fixed in a time dimension, and is incapable of moving among seasons. Farmers have to grow different crops during different seasons in a year, or rotate different crops in sequence if they want to maximize returns. In this sense, even if one type of agricultural production enjoys comparative advantage and has good prospects for export expansion, a farmer cannot expand this production significantly without acquiring additional land. If the comparative advantage is attached to a specific location, then farmers in this area may not be able to expand their production as a whole. Although technological innovation would help to improve land productivity to a certain extent, the output would still be constrained by land limitations, especially in the short run and without significant increases in costs.

In a populous developing country such as China, where even marginal land has been cultivated, any expansion of farm produce with comparative advantage to meet export demand cannot be done by cultivating new land. Rather, it can only be realized by shifting certain cultivated land from its existing usage. However, a climate favorable to production of one crop or animal cannot be extended to other places, so the expansion of agricultural production to cover larger areas and/or other locations may not enjoy the same comparative advantage, at least not to the same extent. Therefore, a certain combination of land, soil and climatic characteristics determine whether a region is favorable to producing certain agricultural products, and is producing at a lower cost with comparative advantage. Even if the same products can be produced in other regions, they can hardly be produced at a comparable cost due to the difference in other natural conditions.

China is vast in land and diverse in natural conditions in different regions. Therefore, each region produces products that best reflect its natural endowment. In this study, we separate the country into six agricultural regions according to natural conditions and the resultant pattern of agricultural production. Each region, because of its natural endowment, is favorable to

producing certain kinds of agricultural production in comparison with other regions of the country.

Region 1 is the Northwest Region, which includes Inner Mongolia, Ningxia, Gansu, Qinghai, Xinjiang and Tibet. Production of sheep wool is concentrated in this region, accounting for 60% of the national total, and that of beetroot has increased from 20 to 80% of the national total in less than 30 years. Region 2 is the Northeast Region consisting of Heilongjiang, Jilin and Liaoning. This region is a major producer of grain crops with 40 to 50% of the country's soybeans and 30% of the country's corn being produced in this region. Region 3 is the North Region, including Beijing, Tianjin, Hebei, Henan, Shandong, Shanxi and Shaanxi. Wheat production in this region is more than 60% of the national total, with cotton production ranging from 30 to 60% of the national total. Rapeseed production is concentrated in this region, involving 25 to 45% of sown area, while production of silkworm cocoons amounts to more than 20% of the national total. Region 5 is the Southeast Region, which includes Zhejiang, Shanghai, Fujian, Jiangxi, Hunan, Guangdong, Guangxi and Hainan. In addition to rice, tropical crops dominate in this region, with around 80% of sugar cane and 50% of rice in China being produced in this region. Region 6 is the Southwestern region, which includes Sichuan, Chongqing, Yunnan and Guizhou. The production of tobacco in this region, measured in share of sown areas, is more than double that of the country in past decades. At the same time, pig meat production in this region accounts for more than 20% of the national total.

From the above description we may conclude that, because of the constraints of natural resources in climate, topography, water, and soil condition, agricultural production in different parts of China varies to a great extent. Table 1 is a summary of major agricultural products in the six regions and their output relative to the national total. It can be seen from the table that in each region there are some agricultural products with high levels of production. The differences in natural conditions and the immobility of land resources lead to production concentrations located in different parts of the country, making it difficult to transfer other production resources among products, other than land itself.

Capital: In economic theory, capital is usually treated as investment in fixed assets that may be used in production for a long time. It provides more or less the same service during its lifespan, while its value is gradually transferred to products over time. However, in many theoretical and empirical studies, capital is also treated as a production resource, and is then

divided into two categories: investment in fixed assets; and cash flow needed for purchasing necessary intermediate inputs such as seed, fertilizer, pesticide and small tools.

Table 1: Regional Output of Selected Agricultural Products (2004)

Product	Output (10 000 Tons)	Percentage (%)	Product	Output (10000 Tons)	Percentage (%)
Region 1			Region 2		
Beetroot	456	78	Corn	3829	29
Sheep Wool	23	60	Soybean	843	48
Cotton	190	30	Fiber corps	40	37
Corn	1675	13	Beetroots	102	17
Grapes	137	24	Rice	1969	11
Region 3			Region 4		
Cotton	276	44	Rapeseeds	593	45
Wheat	5824	63	Silkworm Cocoons	16	22
Corn	4857	37	Sesame	31	44
Sesame	27	39	Rice	4467	25
Peanuts	824	57	Wheat	1654	18
Region 5			Region 6		
Sugarcane	6950	77	Flue-cured Tobacco	115	53
Silkworm Cocoons	26	35	Slaughtered Fattened Hogs	12304	20
Rice	7581	42	Rice	3146	18
Tea	45	54	Tea	22	26
Bananas	584	96	Rapeseeds	296	22

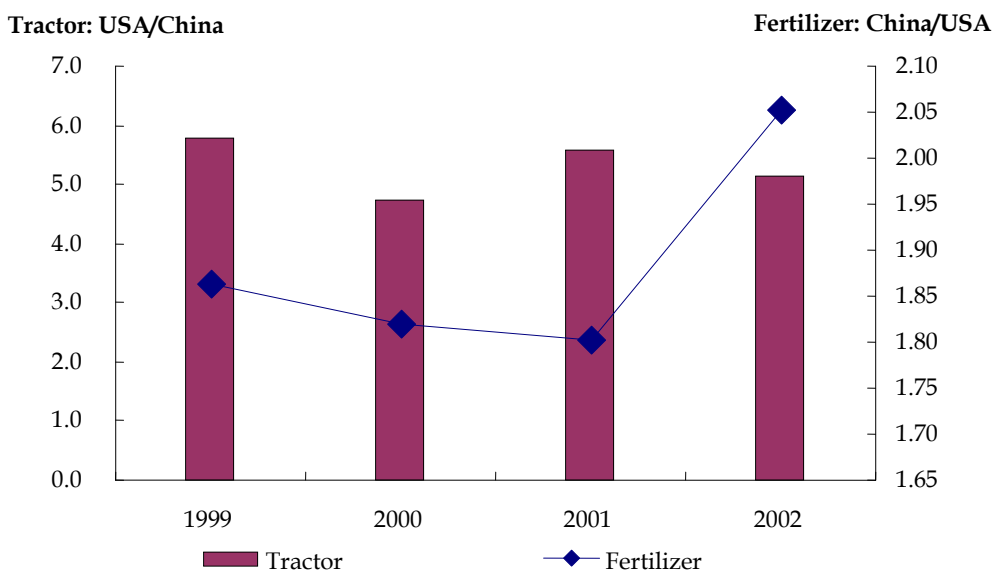
Source: NBS (2005)

Notes: Region 1 includes Inner Mongolia, Ningxia, Gansu, Qinghai, Xinjiang and Tibet. Region 2 includes Helongxiang, Jilin and Liaoning. Region 3 includes Beijing, Tianjin, Hebei, Henan, Shandong, Shanxi and Shaanxi. Region 4 includes Jiangsu, Anhui and Hubei. Region 5 includes Zhejiang, Shanghai, Fujian, Jiangxi, Hunan, Guangdong, Guangxi and Hainan. Region 6 includes Sichuan, Chongqing, Yunnan and Guizhou

In the specific-factors model, capital is regarded as less mobile when compared with labor, because the investment in fixed assets such as buildings and machinery takes up a substantial part of total capital expenditure. In this model, only investment in fixed assets is considered as capital. In this sense, capital is usually production-specific and it is difficult to redirect it to other uses. In the agricultural sector in developing countries, however, the situation is somewhat different because the use of large-scale machinery is rare for small farmers. For the *China's Agricultural Trade: Issues and Prospects*

majority of agricultural producers in developing countries, small-scale agricultural tools are usually used in production of various agricultural products. At the same time flexible capital inputs, such as fertilizer and pesticides, which can be easily switched from production of one crop to another, take up a larger share of the total capital inputs. Figure 1 shows the ratio of the amount of tractor use in the United States to that of China, and the ratio of the amount of fertilizer use in China to that of the United States. The figure shows clearly that China uses as much as two times more fertilizer, and five to six times fewer tractors than the United States in agricultural production.

Figure 1: Shares of Tractors and Fertilizer, China versus the USA



Source: FAO (2003)

Table 2 lists the proportion of different crop-specific production resources – fertilizer and pesticides, machinery, and labor – in total inputs per unit of crop output in different countries for the year 2000. It can be seen clearly that, for each unit of output of these agricultural products, expenditure on flexible inputs such as fertilizer and pesticides are usually higher in China than in other countries, especially developed countries, while investment in the relatively immobile input machinery is much lower.

It could be inferred, therefore, that in Chinese agricultural production, the mobility of capital is relatively high in comparison with that in developed countries, and there is not much difficulty in transferring from the production of one product to another. However, the constraint faced by farmers is the limited availability of capital. Consequently, the capital

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constraints they might face in switching production are less an issue of mobility than that of insufficiency of capital available.

Table 2: Proportion of Inputs in Agricultural Production in Different Countries (2000)

Crop	Country	Cost proportion of various inputs		
		Fertilizers & Pesticide %	Machinery %	Labor %
Wheat	China	22	16	35
	USA	20	18	6
	Canada	36	30	11
Corn	China	23	10	46
	USA	21	30	9
Soybean	China	11	10	46
	USA	14	27	8
Rapeseed	China	19	6	54
	Canada	41	28	9
Indica rice	China	16	9	43
	Thailand	29	24	37
Japonica rice	China	20	16	36
	USA	17	26	9

Source: Huang and Ma (2000)

Human Resources: Labor is another important production resource in the agricultural sector in developing countries that deserves serious consideration when analyzing resource reallocation. Mobility of labor is critically important in connection with open trade policy, because compared with other economic or efficiency considerations, it is much more difficult to find a satisfactory solution when labor is affected by foreign competition.

The mobility of agricultural labor should be analyzed from two different perspectives: as a shift from one kind of production to another within the agricultural sector, and from agricultural to non-agricultural production.

(i) Within the Agricultural Sector: consider first the case in which farmers engaged in one kind of production switch to another kind of agricultural production. In China, as in many other developing countries, obstacles to production changes exist to a varying extent. Natural conditions, production concentration, and technology accessibility are the most obvious.

- Natural conditions and production concentration - as explained in the previous section, the choice of production is to a large extent determined by the landscape and climate of a region. Switching from one production type to another may or may not be feasible. Other than

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that, switching from one large-scale production type to another relatively new and unfamiliar production type usually involves very high transitional costs and possibly a very slow transition. Take Guangxi province in Region 5 as an example. Because of the favorable climate and soil conditions, sugarcane production is prevalent and important in the region. More than 12 million farmers make a living from sugarcane production, and another 100,000 from sugar processing. Tax from sugarcane is also the major source of local government revenue in a significant number of counties in the region. It is, therefore, very difficult in this province to shift sugar production to another kind of agricultural production within a short period, either because of the large number of farmers or because of the local financial dependence. That aside, shifting to new production might also be less profitable due to unfavorable natural conditions.

- Technological accessibility - this is another very important constraint for Chinese farmers in switching from one production type to another. Deep-rooted traditions and rich experience in one production activity make learning and dissemination of new technology difficult, especially when farmers maintain low levels of education and rely heavily on skills passed down from generation to generation. The agricultural technological extension services, in contrast, are still weak in their capacity to provide sufficient support, with only 15 technical personnel to every 10,000 farmers in the country compared with that of 100 in Japan and 200 in the Netherlands. The insufficiency of agricultural extension services makes it risky for farmers to switch to unfamiliar production that requires the adoption of new technology.

In addition to the lack of technological support, farmers also face the risk of fake new varieties and inputs such as pesticides, fertilizers etc., which makes farmers even more afraid of switching to unfamiliar production activities. In Shanxi province, 177 households in Pingyao County bought a new variety of watermelon seeds in the hope of making a good profit for the year. However, after months of hard work on 500 mu of their land, what was waiting for them was no harvest at all. It turned out that the seeds were not qualified varieties but had been illegally sold on the black market. The illegal selling was not punished, and the farmers were not fully compensated and had to bear most of the loss themselves. The lack of a well-established and functioning legal system to resolve disputes adds another obstacle to farmers' ability to switch to new types of production.

(ii) From Agricultural to Non-agricultural Sector: the mobility of labor in the agricultural sector in China is both constrained by its quantity and low quality, as well as by institutional

barriers. The immobility becomes more apparent when migration from rural to urban/industrial sectors is considered.

In terms of quantity, there are various estimates of the “floating population” (rural laborers seeking city jobs) ranging from 90 to 140 million, depending on the source. But the actual amount of surplus labor is much greater than these estimates, because underemployment in the agricultural sector is prevalent. In contrast, non-farm job opportunities are extremely limited compared with the amount of rural surplus labor, and the situation is worsening due to the continuous laying-off of workers in cities in recent years. The official unemployment rate in urban areas reached 7–8% in 2002, which is believed to be an underestimate by many researchers and does not take unemployed rural immigrants into consideration, making it more difficult for rural laborers to move to urban areas. Moreover, both the reform of state-owned enterprise and government policy for attracting foreign investment are capital and technology-intensive. The capital and technology-intensive development strategy adopted in the industrial sectors has dampened labor absorption capability during decades of economic growth. At present, the employment elasticity of GDP growth is 0.1 in China, compared with an average of 0.3–0.4 in other developing countries.

In terms of quality, the education level of rural laborers is generally lower compared with their urban counterparts. Survey data show that about 20–30% of migrants from rural to urban areas have received only primary school education or lower and only 10–20% received education at the senior high school level or above. In contrast, most employers in cities have explicit requirements for education, usually above junior high school, and many require a certain level of employment experience and/or training. The incompatibility of supply and demand in the labor market makes the transition of labor movement from rural to urban areas even harder.

Other barriers also affecting the mobility of rural laborers in China are as follows:

- Household registration system - rural migrants have long been constrained by the household registration system, which prevents them from staying in cities for long periods of time and/or looking for jobs. Even after the relaxation and deregulation of many of the restrictions on migrants, certificate requirements and discriminatory treatment in practice still make it very difficult for immigrants to stay and work in cities for long periods of time.

- Lack of social safety nets - farmers moving into cities are in desperate need of rights that protect basic working and living conditions, as well as the right to basic education for the next generation. At present, migrants employed in cities are paid the lowest and work under the poorest conditions, and their children of school age cannot be enrolled in a local school without the payment of a large sum of money.

- Lack of financial capability and necessary information - some surveys show that most rural migrants are farmers with a household income of above average for their rural locality. Lack of basic necessary financial support prevents a large number of extremely poor farmers from migrating in search of better opportunities. Migrants must usually be self-reliant or use their limited connections with friends in the target urban area to find urban jobs. Job information services for migrant farmers are still far from adequate. All these obstacles hamper the ability of rural laborers to move to the urban sectors.

Institutional Arrangements: There are many other institutional arrangements in the transitional period that greatly restrict the mobility of labor, especially that from rural to urban areas. Social security programs are examples of such institutional arrangements. Pension, health care, and subsidized housing, were all established under the planned economy and attached to a specific region and/or industry, or even to individual enterprises or institutions. Although many reforms have been implemented in social security programs, the Chinese labor force in the urban/industry sectors must still go to their individual employer to obtain such benefits. The design of such programs was probably for convenience and subject to financial constraints at the time, but it has worked against mobility of the labor force, preventing full integration of the labor market.

Because China has not yet established a nationwide social security system, pension and health-care programs are usually run only in the urban/industrial sectors, and are region- and/or industry-, or even enterprise-specific. It is difficult for ordinary factory workers to transfer their accounts or benefits when moving to other places. Because those already-employed workers are not able to leave their existing positions, no vacancies are available to others, and the situation is even harder for new immigrants from the rural areas. The existing social security programs are designed to protect current employees, subject to financial resource constraints in each region, industry, or enterprise. Naturally, it excludes outsiders, but rural

immigrants are affected much more heavily because most such programs are region- and/or industry-specific, and thus benefit local residents.

The expected benefits from pension and health care, as well as some other social security programs, are also based on the ownership status of the respective employer. Benefits provided to civil servants are different to those enjoyed by employees of public institutions such as universities and research institutes, or to those enjoyed by employees of state-owned enterprise, or by employees of private enterprise. Therefore, the existing social security programs that have restricted labor mobility to a significant extent partly contribute to the low level of integration in the labor market.

Another, and probably most severe, obstacle to labor mobility is the cost of housing. The nature of subsidies in urban housing makes it similar to a social security program. For a long time before the mid-1990s, the Chinese government provided virtually free housing to state employees through their employers, and to other urban residents through state housing agencies. Of course housing conditions varied greatly across regions, industries, and institutions. But the costs for existing residents were kept very low even when the housing market emerged in the 1990s. When the privatization of residential housing in the mid-1990s commenced, most apartments were sold to existing residents at a nominal price, which was usually equivalent to 5-10% or less of their market value. Because housing costs have never been reflected in wage reforms, all those who entered the job market now face major problems if they have no housing or cannot share housing, say, with their parents who were beneficiaries of the housing reform.

The current market price for a two-bedroom apartment in a big city is approximately equal to 20 times the annual salary for a factory worker, or even higher, depending on location and other conditions. Urban youth with higher education may earn a higher income and receive help from their parents who purchased housing after the reform, but rural immigrants with a lower education cannot find decent housing for themselves in cities. Without permanent housing, immigrants cannot claim local residential status nor can they enjoy some of the basic social security programs, and their children are denied access to low-cost public primary school education.

The above examples demonstrate that the Chinese labor force is divided into a variety of categories: by region, by industry, by ownership etc. However, the deepest division is between

urban and rural residents, because the latter enjoy very few social security benefits. Naturally, such a division in social program coverage has been an important barrier to labor mobility, and has worked against immigrants from rural to urban areas. The continuous reforms in social security programs and related institutions will gradually narrow the gap between categories, and finally lead to an integrated labor market. However, this is likely to be a long process, and the immobility of rural laborers and their resultant low incomes will continue to be an important subject of public policy, including trade policy, during the transitional period.

Agricultural Resource Mobility and Trade Policy in China

As in many other developing countries, China's agricultural trade policy has been reworked to accommodate domestic issues and to serve the national development goal of industrialization. China was a net grain exporter in the 1950s, although grain output was not high enough to meet domestic demand. But due to the compulsory food procurement and rationing system aimed at mobilizing all available agricultural resources to speed up industrialization, grain was exported to earn foreign exchange, which in turn was used to import necessary industrial products. The famine of the late-1950s to the early-1960s turned China into a net grain importer with the quantity controlled at the minimum level by the state. Because agricultural production was controlled by the state and aimed at grain self-sufficiency, such trade was not a mechanism to improve resource allocation efficiency, and had not taken into account resource mobility at all.

From the early-1980s onward, net grain imports were increased to more than 15 million metric tons, over 4% of total domestic consumption, although domestic production was also experiencing significant growth in China following the 1979 reform. The objective of the increased imports, under the State plan, was twofold: (1) to improve production incentives in the urban/industrial sector with increases in the food supply, and (2) to release production resources for more sugar and cotton production, as sugar and cotton are necessary materials for domestic processing factories, and are also more profitable to produce domestically than to import. In this case, a share of the imported grain was allocated to producers of major cash crops such as cotton and sugar, reducing the burden of grain production for their own consumption. Although the substitution of sugar and cotton for grain production was aimed at saving foreign exchange and to promote industrialization, it improved resource allocation efficiency in the agricultural sector as a whole, and it also raised the income of farmers who were permitted to shift all or part of their grain production to cash crops. However, this kind of

resource reallocation was not fully realized, because major cash crop producers were still required to produce grain for their own consumption, and other farmers were still under compulsory mandates for grain production. Self-sufficiency remained a top priority for the country and was implemented via the State under the compulsory procurement program. Thus the production resources and mobility of farmers were still largely suppressed.

Reforms in the agricultural market that took place in the 1980s and 1990s and which gradually increased farmers' decision-making power and allowed for improvement in their resource allocation, was an important approach to increasing both agricultural supply and farm income. In the late-1990s, the low income of farmers, which was due to immobility of their production resources and inability to switch to other forms of production, was dealt with directly by government policy. For the first time, the State established protective prices that were above the market level for some selected grain crops, for example corn produced in Northeast China and indica rice in Central China. Farmers in the two regions had few alternatives other than to engage in corn or rice production, where immobility of production resources resulted from long-term concentration of corn and rice production, respectively. Protective prices and associated government subsidies were introduced in recognition of the immobility of resources in these regions, and as compensation for farmers who suffered low prices as a result of domestic and international competition.

The goal of agricultural production and trade policy in China has changed remarkably, shifting from ensuring production to improving farm incomes. The subsidy to corn producers in Northeast China, while providing trade protection from international competition, is in fact aimed more at improving farmer's welfare than at increasing the domestic output. It implies that, if corn producers improve their production resource mobility and can be shifted out of corn production to make a profit, the policy would be terminated even if output would be lower. As such, protective trade policy could in fact be reconsidered in comparison to other policy alternatives, such as policy measures to improve farmers' resource mobility, which might come at lower cost.

Conclusion and Policy Implications

This chapter examines the mobility of different production resources in Chinese agriculture: natural resources, capital inputs, human resources and institutional arrangements. The analysis shows that most production resources in Chinese agriculture are low in mobility. Natural

variation in climate, soil and water leads to concentration of production in different regions; a low level of education and lack of accessibility to technology make the conversion of production within the agricultural sector difficult; a large amount of surplus rural labor and the slow growth of urban job opportunities result in limited inter-sector migration of rural human resources; and existing institutional arrangements further add to the difficulties present in human resource movement.

The low resource mobility in Chinese agricultural production has significant policy implications. On the one hand, preference for policies that protect certain crops in certain areas, and where production is concentrated and producers have little alternative for other sources of income, is legitimate and necessary, at least in the short run. When compared with farmers in developed countries, agricultural producers in China are not only a much larger group, but are also more vulnerable because of their much lower and volatile income. This also has significant implications for disadvantaged groups, such as those in poverty and women. As studies and surveys show, rural labor migrants consist mainly of males who come from families of middle-income and above. Women and poor farmers have less mobility, and are more vulnerable to income shock. Therefore, trade protection for a transitional period of time is necessary to avoid social instability and allow time for readjustment.

On the other hand, policy instruments should be explored and implemented to improve resource mobility in the Chinese agricultural sector. Investment in rural education and skill training, in transportation and communication infrastructures, could be expanded. In particular, policy alternatives to improve resource mobility should be explored, as well as alleviation of poverty in the transitional period. Further market-oriented reform to eliminate all institutional barriers and the establishment of social security nets for rural people would also be effective measures to improve resource mobility in the agricultural sector. The ongoing "Development of New Rural Society in China", which is aimed at providing better production, living and development conditions for farmers, is a good start.

From the perspective of policymaking, the costs of protecting a specific sector should be compared with the potential costs of improving mobility of relevant resources, especially that of laborers. The comparison might be useful in assessing whether protection of production or improvement of resource mobility is more preferred in the short run. It is anticipated that, in the long term, government policy to improve resource mobility in the agricultural sector and to

implement a gradual pro-open policy will prove to be more beneficial for both the rural population and the economy as a whole. It is also of significant importance to enhancing farm income, as well as in reducing trade disputes.

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