CHINA'S AGRICULTURAL REFORMS: EXPERIENCE, EMPIRICAL EVIDENCE AND TENDENCY

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A thesis submitted for the degree of
Doctor of Philosophy

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10 November 2004

Dedicated to My Family

Candidate's Statement

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ABSTRACT

After the founding of the People's Republic of China in 1949, a heavy industry-oriented development strategy was implemented by policy-makers in order to modernize the country. Agriculture accounted for more than 70% of total output value and the rural population constituted approximately 90% of the total population. In these conditions the commune system was implemented as the basic unit of agricultural production and organization for China's farmers; correspondingly, a centralized system of agricultural output and input was established. Before the end of the 1970s, although China's industrialization and urbanization had achieved much, the agricultural sector stagnated. The growth of agricultural production and farmers' incomes was very slow and this affected the further growth of industry.

Since the late 1970s the Household Responsibility System (HRS) that replaced the commune system appeared spontaneously and secretly in some rural areas; later it was accepted officially by the policy-makers. The HRS was gradually implemented throughout the whole nation. Thanks to the HRS, which greatly increased farmers' incentives to produce more food, grain purchase prices rose and farmers' incomes increased significantly. At the same time other industrial sectors grew. The success of reforms in the agricultural sector changed the ideology of policy-makers, and encouraged them to use a development strategy of comparative advantage rather than heavy industry development. The establishment of a market economy to replace the planned economy thus gradually became the goal of China's economic reforms.

From the mid-1980s the HRS was sustained in rural areas. At the same time several rounds of reforms about the grain marketing system commenced, but they all failed. The development of agricultural production and farmers' incomes stagnated – as did the incomplete market for grain procurement and marketing – and this encouraged farmers not to produce goods. During the mid-1990s severe inflation appeared in China due to rising grain retail prices and the

supply of grain was very problematic. Under these conditions a traditional administrative measure, namely the Provincial Governor Responsibility System (PGRS), under which the planned sown areas became compulsory, was implemented so that the goal of grain self-sufficiency was attained in every province. The PGRS only temporarily solved the problem of grain supply.

Due to a series of good grain harvests, difficulties in sales of grain and excess stock appeared in the later 1990s, during which time farmers' incomes grew much more slowly and the gap between rural and urban residents widened. From 1998 onward a new round of reform of the grain marketing system began. The feature of this new round of reform was that the central government wanted to solve the problems in the sale of grain and excess grain stock by monopolising the purchase and sale of grain by state-owned grain enterprises. The approaches used here departed from the goal of establishing a market-oriented economy. In 2000, experiments in letting market forces decide the production and sale of grain, took place in some coastal provinces in which grain production was not the main source of farmers' incomes. It was hoped these experiments would correct the unsuccessful measures of 1998 regarding changes in the grain marketing system.

After China's entry into the World Trade Organization (WTO), a number of promises about agricultural production and products had to be fulfilled. Facing international competition, the situation in the agricultural sector became more complicated. The scope for further reforms in China's agricultural sector will be limited.

In this thesis, four features of China's agricultural reforms, namely the HRS, PGRS and regional comparative advantage, grain marketing reform and problems concerning farmers' incomes, will be studied through an analysis of household survey data gathered in grain producing regions. The experiences about successful and unsuccessful measures adopted in China's agricultural sector will be discussed. It will be shown that the agricultural reforms in

China generally start at the bottom at local institutions and then become government policy. When these measures are suitable and successful, they are accepted by the central government and then popularised throughout the nation. At the same time, when facing difficulties in the reform process some centralizing administrative measures are implemented to solve economic problems. The tension between going forward and backward in the process of reforming the agricultural sector is explained partly by the fact that the policy-makers have no full or comprehensive blueprint for reform although the goal is to establish a market-oriented economy. It is also partly explained by the fact that China's policy-makers want to gradually change the country's institutions in order to retain social stability. Thus some radical measures are not considered because they are seen as too risky. In other words, the goal of China's agricultural reforms is certain, but the path and approaches are unclear; and the basic s' logic for reform is to change the economic system and institutions of a stable society, or stabilise the social situation prior to the reforms.

According to the logic of China's s and an analysis of the household survey data, some policy suggestions will be provided. At the same time the tendencies or trends in China's future agricultural reforms will be predicted.

Key words: farmer, reform, HRS, PGRS, grain marketing system, income

ACKNOWLEDGMENTS

I would like to express my profound gratitude to my supervisors, Professor Christopher C. Findlay of the Australian National University, and Dr. Randy Stringer of the University of Adelaide, for their invaluable guidance, constructive advice, and consistent encouragement at all stages of the research. They both acted as constant sources of new knowledge and inspiration.

I am also most grateful to the supervisors of my Master's degree at the College of Economics and Trade, Nanjing Agricultural University, Professor and Dean Zhong Funing and Professor and Director Huang Jikun at the Centre for Chinese Agricultural Policy, Chinese Academy of Sciences. They provided unfailing support and constructive comments throughout my pursuit of the Master and PhD degrees in China and Australia respectively.

Many special thanks are also due to Dr. Chen Chunlai of the National Centre for Development Studies, Australian National University. He is a visiting fellow for the Australia-Japan Research Centre, Australian National University, and kindly provided help during my studies at the University of Adelaide.

Throughout the completion of this thesis, Dr. Fu Longbo of Southern Securities Company of Shenzheng, Dr. Xu Zhigang of the Centre for Chinese Agricultural Policy, Chinese Academy of Sciences, PhD candidates Lu Kaiyu and Yang Wenhui of the College of Economics and Trade, Nanjing Agricultural University, Dr. Wang Xiaolu of the National Centre for Development Studies, Australian National University, and Dr. Song Ligang of the Australia-Japan Research Centre, Australian National University, kindly provided me with much professional advice and large amounts of useful data.

I must thank Deputy Director Li Weiguo of the Bureau of State Farms and Reclamation, Ministry of Agriculture, People's Republic of China. Without his assistance, I would not have had the opportunity to study in Australia.

I do not know how to express my love and thanks to my parents, Xu Zhonghua and Jia Meizheng. Although they could not understand what I wrote, their encouragement and consideration was absolutely essential for my thesis.

Although my grandparents, Xu Tianzhu and Xu-Cheng Shi, died before my birth, I also dedicate this thesis to both of them. They were peasants who worked hard to bring up six children. My uncle, Xu Ke, who was the eldest brother of my father, died at the end of 2001. In order to avoid worrying me, my parents did not at first tell me the bad news. Here, I also express my grief and dedicate my thesis to him.

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GLOSSARY AND ABBREVIATIONS

Glossary

Jin: A Chinese unit that measures weight. 1 kilogram = 2 *jin.*

Mu: A Chinese unit that measures area. 1 hectare = 15 *mu.*

Yuan: A Chinese unit of currency. Currently, 1 U.S. dollar is approximately equal to 8.20 RMB *yuan.*

Abbreviations

ADBC: Agriculture Development Bank of China

CCP: Chinese Communist Party

GDP: Gross Domestic Product

GVAO: Gross Value of Agricultural Output

HRS: Household Responsibility System

MoA: Ministry of Agriculture

PGRS: Provincial Governor Responsibility System

PRC: People's Republic of China

RPRS: Registered Permanent Residence System

SSB: State Statistical Bureau

TVEs: Township and Village Enterprises

WTO: World Trade Organization

CHAPTER 1

INTRODUCTION

This chapter is organized as follows: firstly, it outlines the achievements and processes of China's agricultural reforms since 1978; and secondly, the features of agricultural production and the basic premises which decide the process and adopted approaches of reform are summarized. In the second section, the purpose of this thesis and its structure are explained. Finally, in the last section of this introductory chapter, conclusions are made regarding policy recommendations.

1.1. Introduction

In this section, the achievements of China's market-oriented agricultural reforms, which were first enacted in 1978, will be described, and then the process and features of agricultural reform in each phase will be summarized. Lastly, the main features of China's agricultural production which influence the process and future reforms will be addressed.

1.1.1. The Achievements of Agricultural Reforms since 1978

In China, *nong ye, nong cun* and *nong min,* i.e. agriculture[1], rural areas and farmers[2] are jointly called *san nong*. The development of agricultural production and industry, the promotion of rural areas into towns and cities, and increasing farmers' incomes or changing farmers into industrial workers are the so-called three agricultural problems. These issues are bound together. The settling of one problem will have a strong effect on the other two. How to deal with and resolve the three agricultural problems are of vital importance in China's economic development.

[1] Hereafter, the concept of "agriculture" is not viewed only as agricultural production, but includes such concepts as Township and Village Enterprises.

[2] In this thesis, the concepts of "peasant" and "farmer" are both used to represent China's "*nong min*". In general, before the enforcement of the commune system in the PRC, the concept of "peasant" is used; in the later 1950s and thereafter, "farmer" replaces "peasant".

Continuing economic development in the agricultural sector is critical to ensure China's transition from being a lower middle-income country to a highly developed country. Although China's rural economy has grown rapidly since 1978, there remain many issues concerning agriculture and the marketing system that will affect future growth.

After the founding of the People's Republic of China in 1949 by the victorious Communist Party, the central government adopted a leap forward-type of heavy industry-oriented development as the way to achieve rapid modernization so that China could catch up with or even forge ahead of advanced countries (Lin, Cai and Li, 1996). But the capital-intensive nature of heavy industry contradicted the capital-scarce nature of China's social structure at that time. In 1952, the agricultural sector was the main source of economic production. The share of agricultural GDP in total GDP was 51%, the share of agricultural employment in total employment was 84%, and the rural ratio of the total population was 85% (SSB, 2001). The agricultural sector was the main source for accumulating capital to develop heavy industry since the establishment of the PRC. It was impossible to accelerate the accumulation of capital for developing heavy industry through normal market mechanisms.

In this situation it became necessary for the government to artificially suppress interest rates, and prices of raw material, wages and prices of daily necessities, to reduce the costs of developing heavy industry. In such a distorted macro-policy environment, the resources for agricultural production had to be allocated through a highly centralized planning system. The government implemented a semi-military institution, i.e. the commune system, to manage agricultural production throughout China. To be consistent with such a distorted macro-policy environment and to control the surplus produced by farmers, a monopolized procurement system and marketing of agricultural products were implemented in rural areas. The end result of choosing a

heavy industry-oriented development strategy in a capital-scarce economy led to the trinity of the traditional economic system, namely, a distorted macro-policy environment, highly centralized planned economy and micro-managed institutions without any autonomy. Agricultural production was managed under the commune system and farmers lacked incentives. The prices of agricultural products were suppressed artificially by the government, the procurement and marketing system of main agricultural products was monopolized by state-owned enterprises, farmers' incomes were low and grew very slowly, and migration from the countryside to the cities was banned.

The economic reforms first occurred in the agricultural sector in 1978 when Deng Xiaoping came to power. Before the reforms the income and living standards of both farmers and city workers had been sacrificed for the goal of rapid industrialization. In order to retain social stability and support and the trust of China's people, not only industrialization but also better living standards were made the goals of development and reforms.[3] As a result of these changes to the centralized economic system, China's agricultural sector grew and changed rapidly.

Over the past twenty-three years, the output of agricultural products increased tremendously. As shown in Table 1.1, grain was 1.52 times as large, meat 5.65 times as large, aquatic products 9.18 times as large, and oil-bearing crops 5.66 times as large, as they were in 1978. The per capita annual net income of rural household increased significantly too. The net income in 2000 was 4.84 times bigger than it was in 1978, having increased from 133.6 RMB *yuan* in 1978 to 2253.4 RMB *yuan* in 2000 (SSB, 2001).

[3] Deng Xiaoping always said to let some people become more wealthy first (*rang yi bu feng ren xian fy qi lai.*). Before the reforms the government used administrative measures to achieve equality for everyone but took little account of economic realities or efficiency, so there was a lack of incentive. In order to stimulate productivity, market forces were employed to increase efficiency, despite their creation of unequal incomes.

With rising farmers' incomes, urbanization developed rapidly. Figure 1.1 shows that the urban population increased from 17.92% in 1978 to 36.22% in 2000. At the same time, the rural population decreased from 82.08% to 63.78%. In the same period, the proportion of agricultural output in total GDP declined rapidly. As shown in Figure 1.2, the agricultural share of GDP fell from 28.1% in 1978 to 15.9% in 2000 (since 1978, the agricultural share in total GDP was at its highest in 1982, at 33.3%). The rising urban population and declining importance of agriculture in total GDP are normal for a developing country.

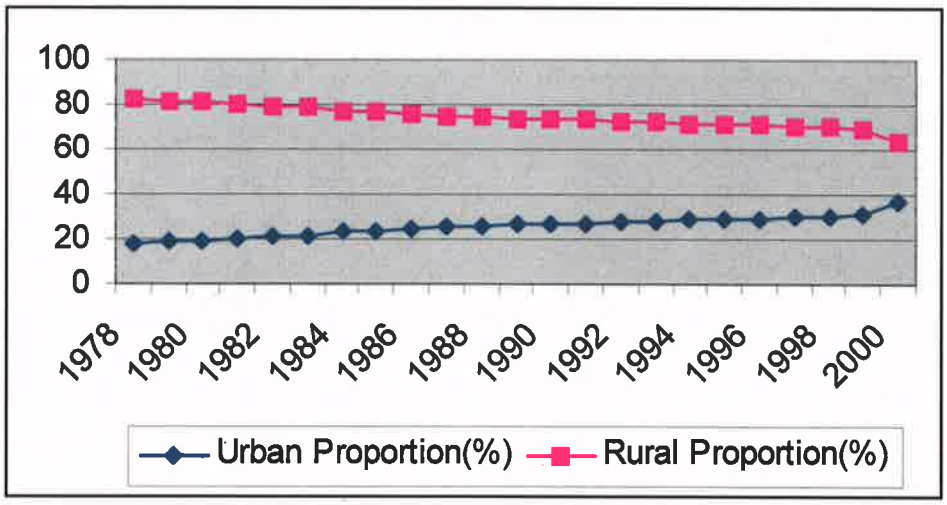
Table 1.1: Output of Major Agricultural Products

(million tons)

	Grain	Meat*	Aquatic products	Oil-bearing Crops
1978	304.77	8.56	4.66	5.22
1979	332.12	10.62	4.31	6.44
1980	320.56	12.05	4.50	7.69
1981	325.02	12.61	4.61	10.21
1982	354.50	13.51	5.16	11.82
1983	387.28	14.02	5.46	10.55
1984	407.31	15.41	6.19	11.91
1985	379.11	17.61	7.05	15.78
1986	391.51	19.17	8.24	14.74
1987	404.73	19.86	9.55	15.28
1988	394.08	21.94	10.61	13.20
1989	407.55	23.26	11.52	12.95
1990	446.24	25.13	12.37	16.13
1991	435.29	27.24	13.51	16.38
1992	442.66	29.41	15.57	16.41
1993	456.49	32.25	18.23	18.04
1994	445.10	36.93	21.43	19.90
1995	466.62	42.65	25.17	22.50
1996	504.54	36.95	32.88	22.11
1997	494.17	42.50	36.02	21.57
1998	512.30	45.98	39.07	23.14
1999	508.39	47.62	41.22	26.01
2000	462.18	48.38	42.78	29.55

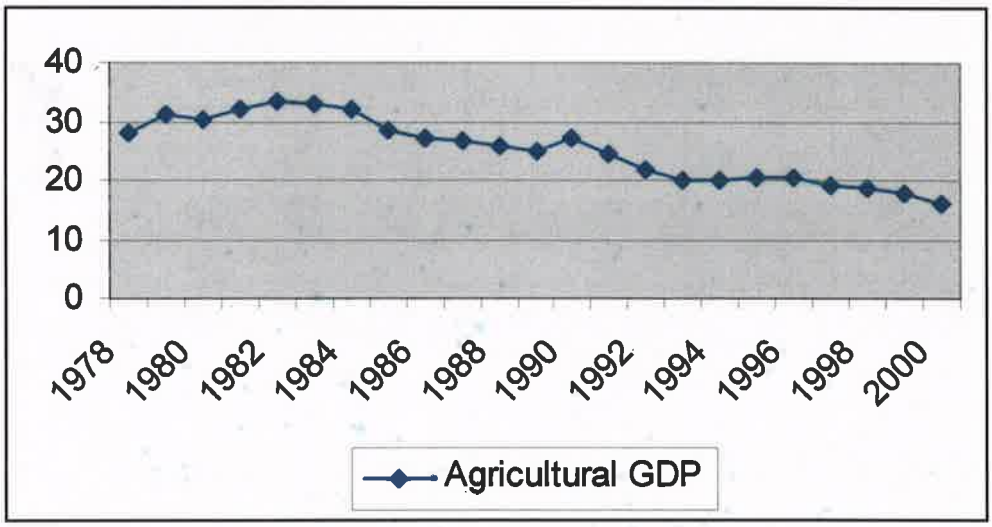
Source: Statistical Yearbook of China (SSB).
*Includes pork, beef and mutton.

Figure 1.1.: Population Composition: 1978-2000



Source: from the Statistical Yearbook of China, 2001 (SSB, 2001).

Figure1. 2: Agricultural Share in Total GDP (%)



Source: from the Statistical Yearbook of China, 2001 (SSB, 2001).

1.1.2. The Process of Agricultural Reform

China's agricultural reform could be classified into four phases: 1978-1984, 1985-1988, 1989-1997 and 1998-the present day. Compared to the first phase, the other three phases of agricultural reforms have all proved unsuccessful.

The first phase of reform came in the late 1970s and early 1980s with the abolition of the commune system, the introduction of the Household Responsibility System, expanding the free market, the encouragement of Township and Village-owned Enterprises (TVEs), and rising grain procurement price. The second phase came in the mid-1980s through liberalization of the unified procurement system and reduction of contracted purchasing. Finally, from the late 1980s onward, the third phase marked the liberalizing of agricultural product prices and reforming the grain marketing system. In 1993 the central government announced that the contract of right of land-use would be extended another thirty years. The extension of the right of land-use increased a farmer's incentive to invest in agricultural production and provided the necessary institutional basis for further development of China's agriculture. Since 1998, in the fourth phase, the central government has wanted to reform the grain marketing system through administrative measures. However, reforming the grain marketing system had been unsuccessful.

After the first phase of agricultural reform, China's growing agricultural production was abnormally high for a few years because of the one-time productivity gains from improved incentives. The success of institutional changes since 1978 in terms of resolving the problem of free-riders[4] due to the commune system and improving China's agricultural productivity was well known (McMillan, Whalley and Zhu 1989; Carter and Zhong, 1991a; Fan, 1991; Lin, 1992; Putterman, 1993). However, the experience of the second, third and fourth phases of China's agricultural reforms which were aimed at changing the grain marketing system revealed some problems.

[4] Free rider: a person who receives the benefit of a good but avoids paying for it.

Before 1978 agricultural products were classified into three categories, according to how they were sold by farmers:

(1). The first category included grain, cotton, edible oil and oil-bearing crops. The government was the sole buyer of these commodities through compulsory quotas and fixed prices. They were called unified procurement commodities.

(2). The second category, called dual-track commodities, included meat and aquatic products, tobacco, tea, silk and sugar. The government set compulsory procurement quotas and prices for these commodities, and permitted free-market sales for any surplus production above the necessity set by government procurement quotas.

(3). The third category, zero-quota commodities, consisted primarily of fruit and vegetables. Although there were no compulsory quotas for these commodities, the lack of a market infrastructure meant the government dominated their procurement and marketing.

The development of China's agricultural economy since 1978 reflected the impact of agricultural policy reforms across all three categories of agricultural products. The major policy changes were: the privatization of agricultural production through the Household Responsibility System (HRS); the development of Township and Village-owned Enterprises (TVEs); and reforming mandatory procurement quotas and prices of agricultural products. The basic features of agricultural reforms were the privatization of agricultural production and the liberalization of agricultural product sales. The privatization of agricultural production through the HRS was consistent with the real situation of China's agricultural productivity and farmers' demands for land. The liberalization of agricultural product sales included: firstly, increasing the purchasing prices of agricultural

products in order to increase farmer's income and incentives to produce; and secondly, the other was to reform the rigid agricultural products marketing system to be more sensitive to the realities of supply and demand. By the end of the 1990s the production and sale of all other agricultural products except grain were decided by market forces.

The reform processes of the second, third and fourth phases faltered, and liberalizing the market for grain was unsuccessful. Each round of agricultural reform of the grain marketing system was followed by further tighter controls on sales of grain. In 1989, the government began an ongoing policy of retrenchment for the major grains and cotton. There was a reversal in 1993 when the government announced a new policy entitled "free the prices with fixed quantity". Later that year, grain and cotton were purchased under tighter state controls. In 1994 fixed procurement quotas prices were reintroduced against farmers' wishes, retail prices reached record levels, even food coupons were reintroduced in some urban areas. Exports of rice and corn were curtailed in order to stabilize prices. That same year, a new system, namely the Provincial Governor Responsibility System (PGRS), was introduced in order to sustain grain production. Herein, provincial governors were ordered to take responsibility for grain production and supply in their jurisdiction. The farmers only had the 'right' to produce grain but not the right to not produce it.

With the adoption of the PGRS and rising grain purchase prices set by central government, since 1995 there were good grain harvests. Farmers' grain sales were very difficult because the state grain enterprises had fewer incentives to purchase grain. In 1998 the government announced a new policy to reform the grain market system in order to reduce state-owned grain enterprises' deficits. Under this new policy, state grain enterprises were the sole buyer of farmers' grain. Controls on grain sales became tighter and tighter. The government controlled not only the market channels, but also the grain production and supply of agricultural productive materials. It

was reported (Li, 2001) that in 1999 the profit of state grain enterprises in Hubei province was 2.2 billion RMB *yuan.* The profits, however, eventuated by transferring burdens from enterprises to farmers. According to the central government, the purchasing price of grain should have been 0.54 RMB *yuan* per *jin,* but the state grain enterprises actually purchased the grain at 0.40 RMB *yuan* per *jin.* The average cost of grain per *jin* in Hubei province was 0.46 RMB *yuan,* therefore the loss on the sale of grain per *jin* was 0.06 RMB *yuan.* A malignant cycle thus took place: the more grain farmers planted and sold, the more losses they had to bear.

In some areas the grain produced by farmers became a burden. Though it provided food for urban residents or resources for the goal of national defence and independence, it did not provide commodities for exchange. The production of grain in these areas incurred losses because the state-owned grain enterprises' purchasing prices could not compensate for the costs. On the other hand, if the farmer did not produce grain, the government would levy not only agricultural taxes but also fines. So, under this grain marketing system established by the central government in 1998, the land in some areas was more of a burden to farmers.

As the result of these policies, farmers' incomes stagnated and the gap between urban and rural incomes[5] widened once again. In 1978, the ratio of rural to urban incomes was 1: 2.57. Due to the abnormal growth of rural incomes since then, in 1985 the ratio was 1: 1.86. But the ratios in 1995 and 2000 were 1: 2.71 and 1: 2.79 respectively (according to the *Statistical Yearbook of*

[5] In China, the *Hu kou* or Registered Permanent Residence System (RPRS), which was managed by the police, was used to distinguish rural and urban residents. The goal of the RPRS was to facilitate the adoption of different policies to manage rural and urban residents and to control people's migration. Most rural residents were farmers. Before the reform, due to the use of food coupons, it was easy to distinguish between rural and urban people because urban residents were provided with monthly food coupons to buy grain from state grain enterprises. Although some rural CCP cadres were also given food coupons, the same policies regarding the farmer, such as employment, education and medical insurance, applied to them. After the abolition of food coupons and rising urbanization, the RPRS was still used. In the *Statistical Yearbook of China,* there is only data about rural residents' incomes, not farmers. In most rural areas the incomes of rural cadres and other employees, such as teachers, were strongly related to the local situation of agricultural taxes from farmers, which were collected mainly for these people's salary. Therefore, the incomes of rural residents could be used to represent approximately the incomes of farmers.

China, 2001 (SSB, 2001)). If taking into account that most rural people did not have social insurance, medical treatment and retirement savings, the income gap between rural and urban people is even wider.

In general, the agricultural reform process in China since 1978 has been from the bottom to the top. In this process, some measures were firstly tried by farmers automatically and secretly, then adopted and promoted in other regions by the government.[6] The basic premise to reform China's agricultural production decided the characteristics of the agricultural sector. Although the market-oriented economy was the goal of economic reforms, the measures used to reach this goal seemed to reflect government planning rather than leaving it to market forces. With the further development of this process, many "bottlenecks" appeared. Since the mid-1990s, with the combined factors of fewer incentives to produce, stagnation of income and especially China's entry into the World Trade Organization (WTO), the situation in agriculture became more severe.

1.1.3. The Features of China's Agricultural Production and the Challenges after Admission to the WTO

Since the economic reforms, a comparative advantage development strategy instead of a heavy industry-oriented strategy has been used to promote industrialization (Lin, Cai and Li, 1996), and the centrally planned economy has gradually given way to a market-oriented one. In this environment, the target set for agriculture has changed accordingly. Before the reforms, the agricultural sector had to provide grain for the cities, raw materials for industrial production, capital for industrialization by suppressing the purchasing prices of agricultural products, and serve as a reservoir for excess urban labor.[7] Since the reforms, however, the goals of China's agricultural development have changed so that enough grain is grown to feed China, to provide

[6] See Chapter 2 in detail.

[7] During the Cultural Revolution from 1966 to 1976, there were millions of surplus urban labourers due to the nearly bankrupt economy. Most of them had graduated from the middle school. For reasons of social stability, these labourers, known as intellectual young man or *zhi shi qing nian,* were exiled to work in the villages.

some raw materials for industry, to integrate the urban and rural economies, and to increase rural incomes. Some policies, such as increasing the grain purchase price, have begun to subsidize or support farmers' incomes. From past experience, however, the grain security or self-sufficiency in grain is still the most important issue when the central government formulates agricultural policies.[8]

In China, grain production is relatively land-intensive compared to many other activities, such as cultivating cotton, sugar, fruit, tobacco and vegetables, which are more labor-intensive (Carter, Zhong and Cai, 1996). Relative to other agricultural products, grain is more land-intensive because grain production requires fewer units of labour per unit of land than other agricultural products. Compared to other agricultural products, the comparative advantage of grain production in China is questionable because, relative to the huge population, land is very scarce. In the long run, China will have an increasing grain deficit due to the combined factors of rising domestic incomes, growing population and declining availability of land to cultivate. The size of the grain deficit depends on policy developments in the grain marketing system, investment in agriculture, development of agricultural technologies, the capacity to exploit regional comparative advantage in grain production, and the changing domestic food market. The size may also relate to exogenous developments in the international grain market.

For many years, due to the adoption of a heavy industry-oriented development strategy, China's agriculture had been taxed in order to support industrialization and urbanization (Lardy 1983; Lin, Cai and Li 1994; Huang, 2000). Anderson (1990) pointed out that many countries in Asia with incomes comparable to China's have followed a similar strategy up to a point at which

[8] After the establishment of the People's Republic of China, due to the embargo by Western countries, China could not import grain from the international market. Self-sufficiency in grain became the most important task for China's agricultural sector. Although the relationship with Western countries later improved, the bitter memories of the 1950s and 1960s encouraged China's policy-makers to retain the policy of grain self-sufficiency.

agriculture takes a smaller share of the economy. The most typical measure of governments in other Asian countries has been to subsidize agriculture. It is very doubtful that China's government is able to copy the measures taken by Japan, South Korea or Taiwan by shifting from taxation to subsidization as China's per capita income increases and agriculture's share in GDP decreases.

The situation in China is unique for the following reasons:

(a) After entry to the WTO, self-sufficiency in grain production is still the long-term goal. According to an extreme estimate of China's grain production and consumption by Brown (1995, p. 19), it has been estimated that China may need to import about 216 million metric tons (mmt) of grain by 2030, which will be greater than the estimated total world trade in grain. In response to the widely publicized prediction of Brown, China's Ministry of Agriculture has estimated that China will be able to feed itself by 2030, by which time China's population will reach 1.6 billion. The Ministry of Agriculture believes that even if the amount of arable land declines quickly and the consumption of grain increases rapidly, the improved yields of existing land through higher investments and an increase in multiple-cropping index can meet the demand for grain;

(b) In China, there are only 0.103 hectares per person or 0.39 hectares per farmer. With the combined factors of a growing population and further development of industrialization and urbanization, the land-population ratio will fall further. In this scenario only labor-intensive technologies can be used in agriculture. High employment with low productivity has historically been the main feature of China's agricultural production and this situation will not change greatly in the near future;

(c) Although urbanization and TVEs have developed rapidly for more than twenty years, over sixty per cent of the total population still live in rural areas and work in agriculture. Thus it would be very difficult for the government to subsidize the majority of the population;

(d) The poor performance of state-owned enterprises means that the government does not have enough funds to subsidize agriculture;

(e) Since the commune system was formally abolished in 1983, the farmers have other mechanisms or institutions to protect their well-being. Since 1949 the central government has placed greater emphasis on urban residents[9] through favorable and biased policies. The lack of any mechanism to protect farmers' benefits and households as the basic unit of production makes agriculture more sensitive to government policies rather than market forces;

(f) After entry to the WTO in 2001, China's agricultural production faces strong competition and/or challenges from Western countries, such as the United States and European Union, and most of China's agricultural products have no comparative advantage compared to Western countries.[10]

The major issues facing the further development of China's grain production are as follows:

(1) The lack of properly functioning markets for grain and production inputs,

(2) The differences in regional comparative advantage in grain production due to the PGRS suppressions which aimed to reach the regional self-sufficiency of grain,

[9] According to the Constitution of the PRC, the working class is the ruling class and farmers are the allies of the workers.

[10] President Jiang Zeming once publicly stated that when he thought about the implications for agriculture after China was granted membership of the WTO he could not sleep well.

(3) The quantity of excess labour in agriculture and the gap between rural and urban incomes, and

(4) Disinvestments in the agricultural sector.

Since the foundation of the PRC, the central government has placed greater emphasis on industrialization and urbanization and the economic well-being of urban residents. Till the early 1980s, the central government has collected more than 400 billion RMB *yuan* from the agricultural sector for the development of the industrial sector through scissors-difference (*jian dao cha*) (Huang, 2000). Since 1978 the mandatory purchase of agricultural products has been a convenient instrument for the government to impose indirect taxes on agriculture. The lowering of domestic agricultural prices places an indirect tax on agriculture and favours manufacturing over the domestic terms of trade against agricultural production. It was estimated by Li (2001) that the direct and indirect taxes collected from farmers amount to at least 400 billion RMB *yuan*[11] every year. So, until now, economic policies remain biased against the agricultural sector, and this is reflected in the domestic terms of trade. These policies are manifested in low incomes for farmers and less investment in agriculture. On average, urban incomes are more than double the rural incomes, and there is serious regional income imbalance. Rural income growth in the central and hinterland provinces has declined. Government expenditure on the agricultural sector has fallen in real terms and as a result the infrastructure, including research and irrigation systems, has deteriorated. It is very doubtful that the agricultural sector can continually be taxed to support a higher growth rate in the industrial sector and continue to maintain a stable China.

[11] According to the *Statistical Yearbook of China* (SSB, 2001), agriculture and related taxes were 46.531 billion RMB *yuan* in 2000, and came directly from farmers. Except for the taxes set by the central government, the government at each level imposes different taxes on farmers. For example, rural cadres could collect taxes from farmers in the name of donations for the development of Township and Village Enterprises.

1.1.4 The Basic Premise of China's Reform in the Agricultural Sector

From 1949 to the late 1970s the central government focused on political ideology or external wars instead of economic development. The Korean War, Sino-India War, Sino-Soviet War and the long enmity with the Nationalist Party in Taiwan, encouraged China to develop heavy industry. A climate of extremism prevailed in China. In this scenario the national economy virtually collapsed in 1976 when the Cultural Revolution ended.

The focus of the Chinese Communist Party has now changed to economic development in order to win the Chinese people's support and trust. Policy-makers believed that without social stability the development of the national economy could not be sustained. On this premise the following approaches have been adopted:

(1). Gradual approaches instead of radical ones will be used to reform the economic system.
(2). Political movement or reform is only of secondary importance for policy-makers.
(3). Owing to complicated conditions throughout in China, different regions will receive different policies.
(4). Some economic experiments could be tried by local governments if they improve economic efficiency and people's incomes.

1.2. Purpose and Organization of the Thesis

The purpose of this thesis is: firstly, to evaluate the success of China's reform of the agricultural sector; secondly to investigate current issues concerning further development of China's agricultural sector; and thirdly, to provide some policy recommendations derived from empirical works based on household survey data.

There are four problems relating to agriculture that will be examined. First is the problem of the Household Responsibility System. Second is the regional comparative advantage in agricultural production and the Provincial Governor Responsibility System. The third is the grain marketing system. The fourth problem is the situation regarding current incomes.

There are seven further chapters in this thesis. The next chapter discusses the background of China's agricultural policies since the 1978 reforms. Firstly, the system implemented in the agricultural sector during the heavy industry strategy before the reforms is described. Secondly, the agricultural reform is classified into four phases, and the major measures adopted in each phase are explained. Thirdly, the critical features of China's agricultural reform are identified, for example the reforms in China's agricultural sector that developed at the bottom of society and moved upwards. Although the market-oriented economy became the goal of economic reforms, once some problems arose in the agricultural sector the Communist Party resorted to centralizing measures rather than market forces to solve them.

In Chapter 3 the data used in this thesis is presented and discussed. There are two categories of data used in this thesis. One is aggregated data, the other is household survey data. The aggregated data comes from the Chinese State Statistical Bureau. The household survey data is collected from the household survey jointly designed and conducted by the Ministry of Agriculture in China and the University of Adelaide. Then some problems in both categories of data are discussed.

Chapter 4 addresses some problems in the Household Responsibility System (HRS). Under the HRS, land fragmentation, which may lead to diseconomies associated with scale and multiple plots of land, occurred. The empirical work based on the household survey data confirms the

existence of diseconomies of scale in the cost of production of rice and wheat under the current HRS. On the other hand, land consolidation may increase agricultural production but it does not suit China because of the great bulk of labour that cannot be absorbed by the Township and Village Enterprises. In order to sustain social stability, the HRS should be retained in the near future.

China is a large country and there are great variations in regional comparative advantage regarding agricultural production. Through internal regional grain trade China could feed itself. The slow growth of grain output and continuous rise in demand induced price hikes in late 1993 and early 1994. In order to counteract this crisis, the Provincial Governor Responsibility System (PGRS) was adopted to control grain production and marketing at the provincial level. The goal of PGRS is to create regional self-sufficiency. In Chapter 5 the grain production at the provincial level is calculated using the aggregated data, and some reviews of PGRS are provided.

Chapter 6 analyses the reforms in the grain marketing system. Before 1998, many measures had been adopted to reform this system and most of them failed. The government wants to use market forces to determine grain production and sales. However, taking into account the large number of Chinese to feed and the loss of confidence in the world market to reach grain self-sufficiency, the government has always acted to solve problems in the grain marketing system. Since 1998 a set of reform policies have been implemented to reform it. These new measures, adopted by the then newly-elected Primer Zhu Rongji, were ambitious and comprehensive but not well-planned. The main feature of this round of reform was government monopoly of grain procurement and marketing. It can be easily concluded, using the household survey data, that the new round of reform for grain marketing system would fail too. Since late 2000, some experiments to reform the grain marketing system in some coastal and richer regions have been carried out, and the

results are encouraging. Since late 2001 some experiments featuring direct subsidies instead of indirect subsidies to farmers occurred in some grain-outflow provinces. Although the process of grain marketing system reform accelerated in 2004, the prospect of extending these experiments to the whole of China is risky.

From 1978 to 1984 farmers' incomes grew rapidly and the gap between rural and urban residents narrowed. Since then, however, farmers' incomes have stagnated and the gap between rural and urban residents is wider. The goal of increasing farmers' incomes is closely linked to the development of Township and Village Enterprises (TVEs), industrialization, and migration from rural to urban areas. In Chapter 7 the composition of farmers' incomes is discussed, based on the household survey data in five provinces where the main source of earnings is agricultural production. Next, some challenges for agricultural production, TVEs and the absorption of labour through urbanization after China's entry to the WTO accession, are analyzed. The chapter concludes with some policy recommendations for farmers' incomes. In the last chapter, some concluding remarks are made on this topic and policy suggestions for further reforms in the agricultural sector and the limitations of this thesis will be presented.

1.3. Some Policy Recommendations

The key policy recommendations of this thesis can be summarized as follows:

(1). The Household Responsibility System should be carried on. In some areas, there are some markets in rights to use land. This trend should be curtailed in some poorer regions because in the current situation this practice will widen the income gap in rural society. However, it should be encouraged in coastal regions because of economies of scale in agricultural production.

(2). The central government should abolish the PGRS gradually so that the inter-provincial grain trade is encouraged. The government should also allow farmers in each region to produce grain according to the regional comparative advantage, become self-sufficient in grain production and increase rural incomes.

(3). Although the Engel index[12] should decline with rising domestic incomes, domestic expenditure on food can increase demands for high quality agricultural products. Thus, the government should encourage and support farmers to produce suitable products that are demanded by consumers. Further, the government should increase investment in agricultural research and development.

(4). The reform of the grain marketing system is critical to the future of China's agricultural system. The slowdown in the growth of farmers' incomes over the past years is partly due to the incomplete nature of the grain market. To reform and perfect this system is the most important and urgent issue for policy-makers.

(5). Upon entry into WTO the situation of employment in China has become more serious. The outflow of rural labor to town and cities and the TVEs' absorption of labor will decline. The growth of rural incomes will become also problematic. The solution to agricultural problems can come only from within the agricultural marketing system itself. At first, the central government should not continue the old policy that has placed greater emphasis on the economic well-being of urban residents compared with rural residents. The policy of low grain prices should be

[12] Ernst Engel, a nineteenth-century German administrator and statistician, stated that as a family's income increases, a smaller and smaller proportion of the income is spent on food. This statement was called Engel's Law. The share of income spent on food in the total income is called Engel's Index. For example, in 2000 the Engel's Indices for rural and urban households were 49.1% and 39.2% respectively in China, which meant that 49.1% and 39.2% in rural and urban households' total income were spent on food. With economic development it has become clear that other basic necessities of life, such as clothing and housing, similarly claim a declining share of a family's growing income. Thus, higher-income groups spend relatively and absolutely larger sums of money on luxury goods and services than do lower income groups.

abandoned because expenditure on grain in urban residents' budget has a relatively low share. Increasing grain prices appropriately will support the growth of rural incomes, enhance the incentives to produce more grain, and create social stability in China.

(6). After entry to the WTO the government should transform the structure of agricultural production. Some measures should be adopted to encourage farmers to cultivate goods with comparative advantage in the international market, and can be exported or exchanged for products where China does not have a comparative advantage.

(7). The central government should abolish the *Hu Kou* or Registered Permanent Residence System, permit all people to freely migrate, and have the same policies such as employment, education and medical insurance for rural and urban residents.

CHAPTER 2
MAJOR AGRICULTURAL POLICY DEVELOPMENTS AFTER 1978

2.1 The Development Strategy of China's Industrialization

The agriculture sector is a part of the national economy. Its growth is determined by the development strategy adopted by the government. Lin, Cai and Li (1996) have pointed out that China used different development strategies before and after the economic reforms of 1978. A centrally planned, heavy industry-oriented strategy was adopted between 1949-1978 as the way to achieve the goal of rapid industrialization in order to catch up with or even forge ahead of advanced countries. The economy failed, however, so changes were introduced in 1978. In order to clearly see the main features of China's agricultural reforms, it is necessary first to examine the strategy for industrialization and modernization since 1949.

2.1.1 The Heavy Industry-Oriented Development Strategy

After the First Opium War (1840-1842) China was defeated and exploited by many Western countries, such as Britain, France, Russia and Japan. The ideal of China's socialist revolution was to make the country strong and the people rich.[1] Many members of the Chinese Communist Party and other parties shed their blood for this ideal. When the Communist Party finally came to power in 1949 and the People's Republic of China was proclaimed, the new leaders faced the problem of selecting the appropriate development strategy and proper administrative institutions to organize China's economic recovery and construction. The Communist leadership selected a heavy industry-oriented development strategy. This choice was not only the result of the worldwide Cold War political and economic environment, but also reflected the political leaders' intuitive wishes.

[1] The Chinese Communist Party was established on 23 July, 1921.

Economic development in China started at a very low level. This feature was a critical factor in view of choosing a development strategy. When the PRC was established in 1949, the total output value from agriculture and industry was only 46.6 billion RMB *yuan* and the per capita GNP was only 66.1 RMB *yuan.* Within the total output value, agriculture accounted for 70% and industry made up 30%. Heavy industry only attributed 7.9% of the total output value (SSB, 1982). Meanwhile, due to the disquiet over the Chinese Communist Party's takeover of mainland China, Western countries led by the United States, launched a series of campaigns to politically isolate and economically obstruct China. As a consequence, China had poor international political and economic relations and had to be ready for war at any time. The national leaders realized that the most important aspect was whether the economy could rapidly recover and advance. In light of China's development and the available knowledge national leaders had at that time, calls for rebuilding the national economy and eliminating poverty and backwardness were synonymous with industrialization.

China's industrial foundation was very weak at that time. The modern industrial sectors accounted for only 10% of the national economy, whereas the agricultural and handcraft sectors accounted for 90%. Nearly 90% of the population lived and worked in rural areas (Liao, 1981). The Communist Party leaders encountered problems of how to mobilize capital and what kind of development strategy to use in order to accelerate industrialization. They chose heavy industry as the path to economic development. There were three reasons for their selection.

Firstly, the selection was made in consideration of international competition. Hoffmann's (1958) research into the industrial structures of various countries suggested that the level of industrialization in an economy was positively related to the weight of heavy industries in its economy. He used the ratio of the industry of consumption materials (light industry) to the industry of capital materials (heavy industry) as the indicator for the level of

industrialization,[2] and discovered that, the more industrialized an economy is, the larger is the share of heavy industry. When China's leaders analyzed the economic structure of advanced countries, they undoubtedly saw that the so-called modern industries implied large, heavy industries, and the proportion of heavy industries in an economy signified its advance and strength.[3] After the Second World War, many developing countries which had been European colonies gained their independence and set out to improve their economies. Many hoped to skip the intermediate stages of economic development and leap forward to a higher level of industrialization. Most selected heavy industry or import substitution as their primary means of accelerating economic development. At that time, international competition for economic development was, to a large extent, reduced to simple competition to increase the weight of heavy industries in the economy (Lin, Cai and Li, 1996). China's leaders believed that the adoption of a leap forward strategy was necessary to win the race for economic development and turn China into an independent and developed country.

Secondly, the international political and economic environment at that time determined the policies. In June 1950 the Korean War broke out. In October of the same year, the United States army reached the Yalu River and its air force invaded China's air space. The war posed a serious threat to China's national security. In response, China decided to mobilize its army and entered the war. While China was involved in the Korean War, it was also in a state of military confrontation with the Nationalist Party (*Kumingtang*) on Taiwan. These political and military situations called for the newly established PRC to quickly improve its national defence and strengthen its ability to mobilize the army. Added to this, Western countries led by the United States, adopted policies of political and economic isolation to cut off China internationally. Such international political, economic and military situations forced China to

[2] Later, this ratio was called the Hoffmann coefficient.
[3] When China's leaders adopted the heavy industry approach, they did not necessarily know anything about Hoffmann's theory.

rapidly set up a rather comprehensive and self-maintained industrial structure. Heavy industries were at its core.

Thirdly, the choice was due to the constraints on the means of accumulation for industrialization. Limited in their experience and knowledge of how an economically backward country could achieve the goal of economic independence, China's national leaders thought that in a dual economy, in which the rural population accounted for 80% to 90% of the total population and most people lived in poverty, if light industries or consumption industries were selected as the priority sectors, the economy would encounter the constraints of a small-sized market and inadequate demand. It would thus be unable to obtain sufficient capital accumulation to build heavy industry. China's leaders had learned from the experience of the Soviet Union[4] and from the reality of China that heavy industries possessed self-servicing and self-cycling features, and that the acceleration of heavy industry development could overcome the constraints of inadequate demand arising from a large but mainly poor agricultural population. These considerations led the leaders to believe that, by accelerating heavy industry, China could realize the goal of forging ahead.

When China selected heavy industry-oriented development as its strategic goal, this was in direct conflict with China's limited resources and ability to mobilize them at this stage of economic development. The first conflict was between the time required for constructing a heavy industry project and the scarcity of capital in China. The second conflict was between the need for heavy industry equipment and scarcity of foreign exchange. The third conflict was between the funds required for a heavy industry project and the economy's ability to mobilize such funds.

[4] The logic behind the process of choosing China's development strategy was similar to the logic employed by the Soviet Union during a similar period in its history. Many Chinese economists, such as Xue (1979), hold the view that China directly copied the guiding principles of nation-building from the Soviet Union. Lin, Cai and Li (1996) thought that Xue's view was not entirely correct.

Given the economy's endowment structure at that time, to solve these conflicts and to provide cheap labour, capital, raw materials, and imported equipment and technology for heavy industry projects, the government distorted the market mechanism and adopted a low interest rate policy, low exchange rate policy, low nominal wage policy, and suppressed the prices for energy, raw materials, agricultural products, living necessities and services. Due to this distorted macro-policy environment, resources had to be allocated by state planning instead of market forces. The finance sector, the international trade and foreign exchange rate management system, material management system, and the procurement and marketing of agricultural products were all monopolized and managed by the state.

Under this macro-policy environment and planned resource-allocation mechanism, a special micro-management institution was implemented. The industrial sector was owned and run by the state collectively in order to increase existing enterprises' profits and capital accumulation. Before the collectivization of agriculture, the procurement and market system of agricultural products were firstly monopolized by the state. Collectivization of agriculture was actually the benchmark for completing the agricultural system that was also required by the distorted macro-policy environment.[5] The problems in the agricultural sector will be analyzed later.

2.1.2. The Comparative Advantage Development Strategy

In essence, the heavy industry-oriented development strategy and the import-substitution strategy[6], which was adopted by some Central and South American countries, are the same. China and other countries that followed the heavy industry path or import-substitution could not follow such a high-cost development strategy. By selecting a very different development strategy, Asia's four Little Dragons have all achieved fast and stable economic growth with

[5] Mao Zedong admitted at that time that the state monopoly of procurement and marketing was an important step towards achieving socialism (see Mao, 1977).

[6] The aims of the import-substitution strategy were to satisfy domestic demand with locally produced industrial products so as to reduce imports, and to promote industrialization. The preferential development of heavy industry was a necessary component for this strategy, which is called the secondary import substitution. The heavy industry-oriented development strategy and import-substitution strategy could be called the leap forward strategy.

relatively equal income distribution. There are many contradictory generalizations about the experience of these economies.[7] Lin, Cai and Li (1996) highlighted the fact that the salient feature of Asia's four Little Dragons' success was better use of their comparative advantage at each stage of their development.

The core difference between the comparative advantage strategy and the leap forward strategy is the overall policy environment. The prerequisite for full utilization of an economy's comparative advantage is a price system that through market competition reflects the supply and demand relationship, and the relative scarcities of products and factors of the production in the economy. Therefore, in the environment of comparative advantage strategy, products' prices and factors are determined by the market, and technological and institutional innovation in the economy are led by the market-determined price signals.

Under the comparative advantage strategy, the policy environment is very different from that of the heavy industry-oriented development strategy. The financial market is flexible and efficient, and the prices of capital or interest rates float freely. The foreign exchange market is flexible. The labour market is competitive, workers can move freely between and within different regions and sectors, there is no artificial boundary or discrimination between rural and urban areas, and the price of labour or wages is determined by the supply and demand conditions of the labour market.

Apart from some legal regulations on certain specific land use in cities and rural areas, land can be transferred freely among owners, users, and for different purposes. From this activity the rent and price of land are determined. In a developed economy the relative scarcity of land

[7] Some economists (James, 1987; Seiji, 1985; Meier, 1983) argued that their success was due to the fact that the governments got the relative prices right and allowed the market to function well. Other economists (Amsden, 1989; Wade, 1990) argued that the success was due to government intervention and intentional market distortions through industrial policies. For some trade economists (Balass, 1982; Krueger, 1978), success was due to having an export-oriented strategy. The growth theorists (e.g., Romer, 1986) argued that their rapid accumulation of capital, especially human capital, attributed to this success.

will increase. Therefore, land rents and prices will rise to reflect such increases. The rising price of land will motivate producers to adopt land-saving technological innovations, and at the same time will promote enterprises that yield the highest marginal productivity. The product market is therefore competitive, distortion-free and well-developed. The price of any input and consumable goods is determined by supply and demand conditions.

Implementing the comparative advantage strategy implies that, through the introduction of a market system, the relative scarcity of resources of production in an economy is revealed to domestic producers through corresponding prices, which in turn induce them to engage in activities that fully exploit the economy's comparative advantages. The economy will thus be very competitive and grow quickly. Therefore, the core of the comparative advantage strategy is the formation of a policy environment that enables the market system to function well. Intentionally or unintentionally, some countries that follow the comparative advantage strategy all undergo a process of economic reform or liberalization to expand their economies' market functions. In the process of liberalization, originally poorly developed, suppressed or distorted market structures and price mechanisms are gradually improved. This process usually includes: (1) changing from financial suppression to financial freedom, (2) changing foreign exchange controls and a multiple exchange rate system to a flexible single exchange rate system, (3) changing from retarding land flow or restricting land transactions to a fully developed land market, and linking the land market to the credit market, and (4) eliminating interregional trade and perfecting the legal framework to protect competition.

Since the opening up of China's economy in the late 1970s, the policy environment has been transformed, and the market now plays a much more important role. The comparative advantage strategy has been adopted gradually to replace the heavy industry development strategy. Due to the lack of theoretical preparation and no clear goal at the beginning of the economic reforms, however, the reforms mainly occurred in the micro-management

institutions that allowed managers and farmers to share in decision-making and profits. However, the reform of the macro-policy environment lagged behind reforms in the micro-management and resource-allocation mechanisms. As a consequence, a cycle of vigour and chaos emerged, which increased the difficulty of implementing measures for further reforms and also led to social instability.

2.2. Basic Features of Agricultural Reform after 1978

China is a large agricultural country. Throughout Chinese history, commerce was despised and agriculture was regarded as the country's basis. Even though the agricultural share in total GDP is now only about 15%, as mentioned in Chapter 1, agriculture is still very important to China's economy. It provides food and is still the principal source of income for more than half of the 1.27 billion Chinese population.

The reform process that began in 1978 started with agricultural reform. It is generally accepted that China's central government never intended the reform to be comprehensive and long-lasting, so the reform was not well-planned in advance. As Deng Xiaoping once said: *Mo Zhe Shi Tou Guo He* ('crossing the river by groping the stones').[8] The first goal of the agricultural reform was to overcome the chaos caused by the Cultural Revolution by reinstituting material incentives in rural areas to stimulate agricultural production. Bolder measures were introduced once these initial successes were realized.

In 1978, rural China was organized into communes. This system was established in the late 1950s as the basic economic institution and communes were largely designed to achieve sufficiency in food production. The commune system lasted more than twenty years in China.

[8] Deng Xiaoping's thoughts were summarized in the so-called "three theories". First, the "Groping Theory", i.e. crossing the river by groping the stones; second, the "Cat Theory", i.e. either black or white, the cat who can catch the mouse is the good one; third, the "Lantern Theory", i.e. watching the green lantern, run ahead! And watching the red lantern, take a devious way to go ahead! Some Chinese leftists believed Deng Xiaoping's thoughts were anti-Marxist or anti-Maoist. Deng Xiaoping was in fact a pragmatist or opportunist.

The commune was not only a government body but emphasized compulsory cooperation, carrying out orders from higher levels of government and managing small-scale enterprises and shops. Before its termination, a typical commune consisted of ten to fifteen production brigades, with each brigade divided into about ten production teams of twenty to thirty households. The production brigade passed orders and allocated quotas from the commune, and operated primary schools, clinics and shops. Under the auspices of the production brigade, the production team represented the basic unit of organization responsible for agricultural production, accounting and income distribution. The central government also monopolized the procurement and marketing system for most agricultural outputs and inputs, and centralized sown area plans were implemented.

In China the allocation of land was done in such a way to achieve equality but not efficiency. From past history (Huang, 2001), the rise and fall of each dynasty without exception was directly related to the allocation of land among peasants. In the early phase of each dynasty, the ruling group allocated the land fairly equally among peasants and restricted the annexation of land. When this changed and more land was being given to bureaucrats and landlords, the peasants revolted. In each peasant uprising the slogan always included the goal of average land ownership.[9]

Before the founding of the People's Republic of China in 1949, there were three civil wars in China in less than one hundred years: the Taiping Heavenly Kingdom peasant revolt (1851-1864, i.e. First Land Revolutionary War), the Second Land Revolutionary War (1927-1937) and the Third Land Revolutionary War (1947-1949, i.e. Liberation War). From the names of these three civil wars, we can note that the core issue of these wars was land ownership, i.e. the relationship between land and people and the desire to achieve more equal land ownership for peasants. After the War of Resistance Against Japan (1937-1945), having

[9] As early as the Northern Song Dynasty (A.D. 960-1127), in the uprising of Wang Xiao and Li Shun in Sichuan province, the leaders declared their wishes to divide land ownership equally among the peasants.

adopted the policy of sharing land equally among peasants in liberalized areas (*jie fang qu*) that were controlled by the Chinese Communist Party, the Party defeated the Chinese Nationalist Party (*Kuomintang*) government[10] in the Third Land Revolutionary War. In the course of a 'new-democratic revolution'[11] (1952-1957), the central government extended the policy of dividing land among peasants in China (except Tibet, which began land reform in 1959).

Chinese Communist Party leaders all regarded industrialization as modernization.[12] Therefore, the strategy of a leap forward-type of heavy industry-oriented development was initiated. The Chinese government hoped to achieve rapid industrialization so that China could catch up with or forge ahead of the advanced countries. But the capital-intensive nature of heavy industry contradicted the scarcity of capital in China. It was impossible to accumulate the capital used to develop or accelerate the growth of heavy industry in China through the normal market mechanism. At that time agriculture was the main source of production. For example in 1952 the agricultural share in GDP was 50.5% and industrial share was only 20.9% (SSB, 2001). So, it was only agriculture that could provide most of the necessary capital for heavy industry. Therefore, in order to control the surplus produced by farmers and implement the monopolized procurement and marketing system of major agricultural products in rural areas, the central government collectivized agriculture.

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[10] Dr. Sun Yat-sen (Sun Zhongshan), the founder of the Nationalist Party and the Republic of China that was established on 1 January, 1912 in Nanjing City, also put forward his policy to divide the land equally among peasants by having the government purchase land from landlords. This policy was never implemented. During the 1950s the Nationalist Party government led by Chiang Kai-shek (Jiang Jieshi) and Chen Cheng adopted this policy and began land reform in Taiwan (Chen, 1951). Sun Yat-sen's thoughts were summarized as the Three Principles of the People (*san ming zhu yi*), i.e. Nationalism, Democracy and the People's Livelihood (*ming zhu, ming quan, ming sheng*). The core of the Principle of the People's Livelihood was for peasants to share land ownership equally.

[11] In Chinese Communist Party documents (Mao, 1940), the phase of new-democratic revolution was only the transition period. In this period, China had to change to a socialist country. A socialist country is the lowest or most basic phase of Communist society. The period 1950-1952 was the period of recovery for the national economy from China's civil war.

[12] Chairman Mao once said there should be thousands of great funnels around Tiananmen Square. Before the founding of the People's Republic of China, Mao had never traveled outside of China. Only in the 1950s did he travel and this was to the Soviet Union - twice. What he learnt about capitalism or modernization or industrialization was second-hand and from books. Most Chinese people and theorists regard him as a traditional dictator instead of a Marxist-Leninist. Compared to Chairman Mao, Deng Xiaoping once worked in a car factory in France in the 1920s. He thus had direct experience of capitalism and the processes of industrialization.

In 1957 the commune system was established and gradually spread throughout China's rural areas. Land ownership changed from household-owned to collectively-owned and only state grain enterprises could purchase grain and other agricultural goods from farmers. In the late 1950s and early 1960s there was a great crisis in China. Millions of people starved to death because of the failure of the Great Leap Forward (1959-1961), natural disasters and some problems of free-riding caused by the commune system (Lin, 1990). The drawbacks of the commune system were recognized clearly by some Chinese leaders, such as President Liu Shaoqi and the General Secretary of the Chinese Communist Party, Deng Xiaoping, and they initiated policies to reform some aspects of central planning in agriculture. Soon afterwards, some limited experiments of agricultural production, which linked remuneration to the quantity and type of work, were performed in some areas, on the condition that collective ownership and management would remain. These experiments were then summarized as *san zi yi bao,* and became the official methods of production in China's agricultural system. Although agricultural production recovered rapidly from the devastation inflicted by the Great Leap Forward, the Cultural Revolution that occurred from 1966 to 1976 criticized *san zi yi bao* and described these measures as capitalist.

In the mid-1970s, some provincial governors secretly planned reforms in agricultural production as the first step for Chinese economic recovery and openness. The core of the agricultural experiment was to share the right of land-use equally among farmers. This so-called *Da Bao Gan* or *Bao Gan Dao Hu* system, which was secretly introduced by some farmers in some locations in Anhui province, was first tried in the mid-1950s.[13] It was implemented again in the early 1960s and later became known as the Household Responsibility System (HRS). The HRS is a type of private farming system, with the propriety right divided into ownership (by the team or village) and management (by the

[13] At first, the experiment was tried by the farmers with the tacit agreement of the local cadres.

household). In this contract the individual farm household has the right for land-use, production and procurement quotas, and in some areas even part of the fixed assets from production teams. At first, the contract period of the right of land-use was fifteen years.

As late as 1980, even if the farmers had lost all confidence in the commune system and collective farming, the central government still insisted on collective farming and reluctantly accepted the HRS as inevitable. As the reforms developed further and rather quickly, the HRS was openly encouraged by the central government in 1981. From then on, direct control over agricultural production and sown area plans was loosened, and indirect control through procurement and marketing systems became a principal tool in government planning. In the early 1980s, free markets began to be developed for fruit, vegetables and meat. In the mid-1980s, unified procurement was abandoned, a two-track price system was implemented, farmers were allowed to sell more of their products in free markets, and market forces started to play a more important role in resource allocation. The application of centralized planning in agriculture declined until 1994, when it resurfaced again.

When the commune system was formally abolished in China in the mid-1980s, the township and village inherited most of the functions that had previously been performed by the commune and production brigade. The township and village were administrative bodies but at the same time they also managed the collective property left by the commune system. Individual farmers signed an HRS contract with the village. According to land size and family numbers, procurement quotas, taxes and other obligations to the different level of government were allocated by the township and village. In many cases, the townships and villages managed the Township and Village Enterprises (TVEs), ascertaining that they provided some subsidies to agricultural production, supported the social welfare system, and operated primary and/or high school education. The township and village organizational structure constituted the basic government for China's farmers. At the end of 2000, there were 43,735

township governments, and the average number of households controlled by township government was about 5522 (SSB, 2001). The village was about the same as the former production brigade. At the end of 2000 there were 734,715 village governments and the average number of households in villages was approximately 329 (SSB, 2001). The economic cooperative at the township or village level provided financial services, supplied input materials, and provided some services relating to the marketing of output.

Finally, the *cunmin xiaozu* (farmer team) was roughly equivalent to the former production team, and consisted of about twenty to thirty households. According to the Chinese constitution, the *cunmin xiaozu* owned land, but in fact the central government established the length of land leases. The *cunmin xiaozu* was responsible for contracting out land-use rights, passing on a share of mandatory procurement quotas, and distributing tax obligations to each household. In some areas the *cunmin xiaozu* provided some services to individual households.

Over the past twenty-three years China's agricultural production has developed significantly. As shown in Tables 2.1 and 2.3, the Gross Value of Agricultural Output (GVAO) has increased from 139.7 billion RMB *yuan* in 1978 to 2491.58 billion RMB *yuan* in 2000 at a growth rate of 5.9% per annum. Over the same time period, grain output has increased from 304.77 million tons in 1978 to 462.18 million tons in 2000 (the highest level is 512.30 million tons in 1998) with a growth rate of 2.29% per annum. Table 2.1 shows the average annual growth rate for China's GVAO from 1978 to 2000, for the four main components of GVAO: farming, forestry, animal husbandry and fisheries. By far, farming and animal husbandry are the two most important components, accounting for 55% and 30% of GVAO respectively, in 2000.

The Chinese people's taste in food has changed markedly due to increased per capita annual net income. The demand for grain decreased and the demand for meat, eggs, milk, and aquatic

products increased. The development of animal husbandry and fisheries grew rapidly at rates of 9.3% and 11.4% respectively from 1978 to 2000. During the same period, the growth rate of farming output was 5.2%, and that of forestry was even lower at only 5.1%. The importance of farming in GVAO declined rapidly, and its proportion in GVAO was 80%, 65% and 55% for 1978, 1990 and 2000 respectively. The sectors of animal husbandry and fisheries developed very quickly, and the proportions were 15%, 26%, 30%, and 2%, 5%, 11%, respectively for 1978, 1990 and 2000.

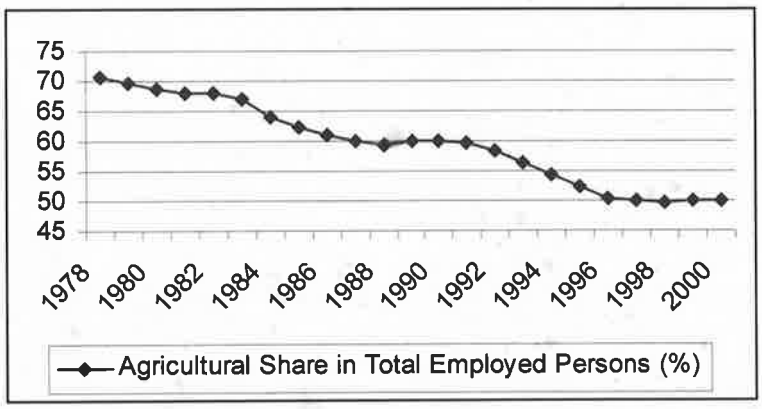
During the thirteen years prior to reform in 1978, the purchase price of grain through government procurement, on average, rose by only 17.5% (Carter, Zhong and Cai, 1996), but there was almost a 20% increase in the purchase price in 1979 alone. As shown in Table 2.2, from 1978 to 2000 the purchase price of agricultural products through government procurement rose by 7.1% per annum. The increased procurement prices improved farmers' incomes. During the same time period the growth rate of the per capita annual net income of rural households was 7.6%, and the growth rate of retail prices increased by 5.9% per annum. Therefore, farming families' living standards improved significantly.

China is the world's largest producer and consumer of grain, with rice, wheat, corn and soybean being the main types of grain. Measured in sown area, grain production is the largest component in the farming sector, accounting for 69.39% of total sown area (SSB, 2001). During the past twenty-three years, even as its share of sown area fell from 80.34% in 1978 to 69.39% in 2000, grain production and productivity have developed steadily. Due to the great population and limited amount of cultivated land per capita, China's farmers constantly encounter political pressure to increase grain supply. Substantial technological advances have been made in grain production. Farmers maximize grain yields by using more capital to build irrigation works, increasing the multi-cropping index and using good strains of seeds and advanced technologies. In Table 2.3, the grain output, sown area and yield are shown. Grain

output increased from 304.77 million tons in 1978 to 462.18 million tons in 2000 (about 52% in total, or 2.29% per annum), and yield increased from 2527.32 kg/ha in 1978 to 4261.26 kg/ha in 2000 (about 67% in total, or 2.27% per annum.). During the same period of time, the area of sown grain decreased by 0.44% per annum.

Increased agricultural productivity fundamentally changed China's social structure. As illustrated in Figure 2.1 below, agriculture's share of total employment decreased, from 70.53% in 1978 to 50.00% in 2000 (1.06% decrease per annum). China's urbanization and industrialization developed accordingly.

Figure 2.1: Agricultural Share in Total Employed Persons (%): 1978-2000



Source: Statistical Yearbook of China (SSB, 2001)

Table 2.1: Values and Real Growth Rates of Gross Value of Agricultural Output, 1978-2000

	GVAO (billion RMB *yuan*)*	Growth Rate of GVAO (%)	Growth Rate of Farming (%)	Growth Rate of Forestry (%)	Growth Rate of Animal Husbandry (%)	Growth Rate of Fisheries (%)
1978	139.70	-5.1	9.8	5.5	4.9	0
1979	169.76	7.6	6.7	1.3	14.6	-3.4
1980	192.26	1.4	- 0.3	12.2	7.0	7.7
1981	208.06	6.5	6.8	4.1	5.9	4.4
1982	248.33	11.3	10.9	8.5	13.4	12.3
1983	275.00	7.8	8.5	10.2	3.9	8.6
1984	321.41	12.3	11.5	19.0	13.4	17.6
1985	361.95	3.4	-0.2	4.5	17.2	18.9
1986	401.30	3.4	2.7	-3.6	5.6	20.5
1987	467.57	5.8	6.4	-0.3	3.2	18.1
1988	586.53	3.9	1.4	2.3	12.6	11.6
1989	653.47	3.1	2.4	0.4	5.5	7.2
1990	766.21	7.6	8.0	3.1	7.0	10.0
1991	815.70	3.7	0.9	8.0	8.8	7.6
1992	908.47	6.4	4.2	7.7	8.8	15.3
1993	1099.55	7.8	5.2	8.0	10.8	18.4
1994	1575.05	8.6	3.2	8.9	16.7	20.0
1995	2034.09	10.9	7.9	5.0	14.8	19.4
1996	2235.82	9.4	7.8	5.7	11.4	14.0
1997	2376.40	6.6	4.5	3.3	9.5	11.5
1998	2451.67	6.0	4.9	2.9	7.4	8.8
1999	2451.91	4.7	4.3	3.2	4.6	7.2
2000	2491.58	3.6	1.4	5.4	6.3	6.5
Average Growth Rate (%)						
1978-00		5.9	5.2	5.1	9.3	11.4
1978-84		6.0	7.7	8.7	9.0	6.7
1985-88		4.1	2.6	0.7	9.7	17.3
1989-97		7.1	4.9	5.6	10.4	13.7
1998-00		4.8	3.5	3.8	6.1	7.5
Share of GVAO (%)						
1978		100	80	3	15	2
1990		100	65	4	26	5
2000		100	55	4	30	11

Source: Statistical Yearbook of China (SSB, 2001) and Comprehensive Statistical Data and Materials on 50 years of New China (SSB, 2001).
*Notes: * calculated at the current prices.*

Table 2.2: Purchasing Price Index of Agricultural Products, Index of Per Capita Annual Net Income of Rural Household and General Retail Price Index, 1978-2000 (1978=100)

Year	Purchasing Price Index of Agricultural Products	Index of Per Capita Annual Net Income of Rural Household	General Retail Price Index
1978	100.0	100.0	100.0
1979	122.1	119.2	102.0
1980	130.8	139.0	108.1
1981	138.5	160.4	110.7
1982	141.5	192.3	112.8
1983	147.7	219.6	114.5
1984	153.6	249.5	117.7
1985	166.8	268.9	128.1
1986	177.5	277.6	135.8
1987	198.8	292.0	145.7
1988	244.5	310.7	172.7
1989	281.2	305.7	203.4
1990	273.9	311.2	207.7
1991	268.4	317.4	213.7
1992	277.5	336.2	225.2
1993	314.7	346.9	254.9
1994	440.3	364.4	310.2
1995	527.9	383.7	356.1
1996	550.1	418.2	377.8
1997	525.3	437.4	380.8
1998	483.3	456.2	370.9
1999	424.3	473.5	359.8
2000	409.0	483.5	354.4
Average Growth Rate (%)			
1978-2000	7.1	7.6	5.9
1978-1984	7.1	16.5	2.5
1985-1988	12.5	5.7	10.2
1989-1997	9.6	3.9	9.4
1998-2000	-7.9	3.4	-2.4

Source: Statistical Yearbook of China (SSB, 2001)

Table 2.3: Grain Output, Grain Sown Area and Grain Yield, 1978-2000

	Grain Output (mmt)	Grain Sown Area (million ha)	Grain Yield (kg/ha)
1978	304.77	120.59	2527.32
1979	332.12	119.26	2784.83
1980	320.56	117.23	2734.45
1981	325.02	114.96	2827.24
1982	354.50	113.46	3124.45
1983	387.28	114.05	3395.70
1984	407.31	112.88	3608.35
1985	379.11	108.85	3482.87
1986	391.51	110.93	3529.34
1987	404.73	111.27	3637.37
1988	394.08	110.12	3578.64
1989	407.55	112.21	3632.03
1990	446.24	113.47	3932.67
1991	435.29	112.31	3875.79
1992	442.66	110.56	4003.80
1993	456.49	110.51	4130.76
1994	445.10	108.54	4100.79
1995	466.62	110.06	4239.69
1996	504.54	112.55	4482.81
1997	494.17	112.91	4376.67
1998	512.30	113.79	4502.15
1999	508.39	113.16	4492.66
2000	462.18	108.46	4261.26
Average Rate (%)			
1978-2000	2.29	-0.44	2.72
1978-1984	5.45	-0.91	6.41
1985-1988	-0.73	-0.60	-0.17
1989-1997	2.63	0.29	2.31
1998-2000	-2.06	-1.31	-0.83

Source: Statistical Yearbook of China (SSB, 2001)

2.3. Stages of Agricultural Reform

The agricultural reform process can be divided into four chronological stages: 1978-1984, 1985-1988, 1989-1997, and 1998-present day. The first stage (1978-1984) was a period in which China's economic reform primarily focused on agriculture. Agriculture developed rapidly when the policy of HRS was implemented. During the second stage (1985-1988), urban reforms began and these led to overheated industrial growth and double-digit inflation. In agriculture the policy reform was focused on liberalizing the mandatory procurement system, except for grain and cotton. In the third stage (1989-1997), there was economic

retrenchment from 1989 to 1991 in order to adjust the overheated macro-economic situation. Following Deng Xiaoping's visit to the southern Chinese provinces in 1992, non-agricultural reforms developed speedily. In agriculture, the central government eliminated urban food subsidies, increased the grain purchase price significantly and attempted to reform the grain markets. During the fourth stage (1998-present), although there was a financial crisis in Southeast Asia, China's economy developed steadily. Regarding agriculture, the government wanted to reform the grain marketing system through radical administrative measures in 1998. After one unsuccessful year, there were a few experiments with the grain marketing system in some richer coastal provinces.

2.3.1. The First Stage (1978-1984)

In the agricultural sector, procurement increased by 22.1% in 1979 alone (see Table 2.2), and the above-quota price premiums were also increased. From 1978, various agricultural production responsibility systems were tried in many places in China, and finally the HRS became the dominant form. With their new found decision-making power under HRS, farmers responded to the increased purchase prices by boosting production with the available technology. The central government relaxed sown area plans to an extent, reduced procurement quotas gradually and even abolished them for some commodities. At the same time, other selling channels appeared. Free markets were formally opened to provide farmers with more opportunities to sell their surplus goods after fulfilling quota delivery obligations. Furthermore, private long-distance shipping and marketing of grain were allowed.

Under these new policies, China's agriculture developed significantly. In only six years, GVAO increased from 139.70 to 321.41 billion RMB *yuan,* in nominal terms. In real terms, it increased at a very impressive rate of 6.0% per year. The real annual growth rate of four sub-sectors — farming, forestry, animal husbandry and fisheries — were 7.7%, 8.7%, 9.0% and 6.7% respectively. At this stage grain production increased from 304.77 to 407.31 million

tons, equivalent to an annual increase rate of 5.45%. The growth rate of grain yield was impressive at 6.41% per year. During this period cotton increased even faster at 19.3% annually, from 2.17 to 6.26 million tons. Meat (including pork, beef and mutton) production increased from 8.56 to 15.41 million tons, and aquatic production increased from 4.66 to 6.19 million tons. The annual growth rates were 10.3% and 4.8% respectively for meat and aquatic products.

During this stage, the annual growth rate of the grain purchase price was 7.1%, and the annual growth rate of general retail price was only 2.5%. The living standard of the rural household improved. The annual growth rate of the rural household income was 16.5%. In 1978, the ratio between urban-rural household incomes was 1:2.57, and the ratio was 1:1.83 in 1984. The gap between urban and rural household incomes narrowed.

2.3.2. The Second Stage (1985-1988)

China's agriculture reforms in the first stage had been carried out successfully. These great achievements encouraged the central government to implement more comprehensive and bolder measures to reform China's economic system, and the reform focus shifted from the rural to the urban sector

The major policy measures implemented including enterprise tax and wage reform, banking and financial reform, double-track pricing, revenue-sharing systems between central and local governments, and opening up fourteen coastal cities, in addition to the Special Economic Zones established in the first stage. Although the urban sector benefited significantly during this stage, inflation was double-digit and the national economy had been overheated since 1988. The rural sector was adversely influenced by the policies adopted.

As described earlier, HRS and increased purchasing prices for agricultural products were two of the most important components of the great achievements in the rural sector. Table 2.2 notes that the annual growth rate for the purchasing prices of agricultural products was 7.1% from 1978 to 1984. In the same period, grain's farm-gate quota prices were doubled, and negotiated prices more than doubled (Carter, Zhong and Cai, 1996). At the same time, the government did not raise urban retail food prices. Retail grain prices increased by only 6.3% from 1978 to 1980, and by 9.9% from 1980 to 1985 (SSB, 1990). With higher incomes, per capita food consumption soared, especially for meat. Urban food subsidies consequently reached one quarter of the total government budget during this period. The budgetary burden associated with urban food subsidies increased, limiting the government's ability to invest in industrial development. The situation became worse with the record-breaking harvest in 1984 (see Table 2.3), which induced many problems in purchasing and storing the large surpluses of grain and cotton. In order to ameliorate the situation, the government reformed the procurement system into a so-called contracted purchasing system. Under the new system the unified prices were equal to the weighted average of the former quota and above-quota prices. The marginal prices for agricultural products were the unified prices instead of the former above-quota price, and the marginal price for grain was reduced by 35% (Carter, Zhong and Cai, 1996). In addition, as the only buyer of cotton, the government cut its purchases both in 1985 and 1986. Thus, the farmers responded by decreasing both grain and cotton sown areas, and the application of other inputs in their production. As a result grain and cotton production decreased by 7% and 34% in 1985 and 1986 respectively.

As grain production fluctuated and did not reach the 1984 level until 1989, the central government announced that its purchasing contracts with farmers were "state contracts". The delivery quotas were still compulsory and farmers were permitted to sell their surplus only after fulfilling the quota obligations. The purchasing prices for agricultural products were raised again. As shown in Table 2.2, the growth rate of purchasing prices was 12.5% per year.

On the other hand, over this period, some administrative measures through local cadres were implemented, such as sown area and procurement plans. In this period, although the industrial sector developed rapidly, grain production stagnated. Grain production was 394.08 million tons in 1988, which was 3.2% lower than that of 1984, and declined by 0.73% each year. Grain yield reduced as well, by 0.17% per year (see Table 2.3).

As described in Table 2.1, the GVAO in nominal terms reached 586.53 billion RMB *yuan* in 1988, but the annual growth rate in real terms was only 4.1% from 1985 to 1988, which was lower than the rate of 6.0% for the previous period. Structural changes in the agricultural sector were dramatic. Farming and forestry grew at 2.6% and 0.7% respectively per annum, whereas annual growth rates of animal husbandry and fisheries were 9.7% and 17.3% respectively.

Although the purchasing prices for agricultural products increased by 12.5% per annum, and general retail prices grew by 10.2% per annum, the annual growth rate for rural households' net incomes was 5.7%, which was much smaller than that of the first stage. In 1988, the ratio between rural and urban household income was 1:2.17, which was higher than that of 1984. The gap between rural and urban incomes had widened again.

2.3.3. The Third Stage (1989-1997)

Although the reform policies implemented in the second stage boosted the industrial growth rate, they also led to two-digit inflation in 1988 (18.53% increase in general retail price) and social instability (witness the Tiananmen Square incident of 4 June, 1989). To slow down the inflation rate and stabilize the social situation, the central government postponed further reform of the price system, tightened the money supply and credit, recentralized controls over prices for many commodities, and cut or postponed investment in a large range of projects under the rectification program. As a result, during 1989—1991, the annual growth rate of

GDP (in real terms) was 5.7%, much lower than the 10.25% achieved over the previous eleven years, and 11.30% during 1985—1988 (SSB, 1994).

During 1989—1991 the agricultural sector recovered. Grain production, which was of major concern to the government, increased significantly, and so did other agricultural production. In 1990 grain production reached a new record level of 446.24 million tons, which was 9.56% higher than that of 1984. In nominal terms, GVAO reached 815.70 billion RMB *yuan* in 1991. The purchasing price decreased by 0.4% per annum so the growth rate of GVAO in real terms was only 4.8% in this period.

As early as the end of 1990, some measures were introduced to bring the economy back from the low growth of the retrenchment period, and the rectification program was formally declared at an end after Mr. Deng Xiaoping's visit to the southern provinces during the spring of 1992. Later that year when the so-called socialist market economy became the goal, the process of reform accelerated once again, with the objective of creating a market-oriented economy, including a restructure of the role and function of government. In 1994 a package of wide-ranging reforms in the finance sector, trade and tax system was introduced. From 1992 onward the GDP in real terms had grown by 11.53% per annum over 1992—1997 (SSB, 2000). On the other hand, the reform process in rural areas showed signs of fluctuation.

In the first stage, HRS was used in agricultural production, and the contract period was a lengthy fifteen years. To encourage farmers to invest more in agricultural production and based on past successful experience, the contract period was extended to another thirty years throughout the whole country when contracts began to expire in 1993. The agricultural marketing system was further liberalized. In order to reduce its budgetary burden, the government increased retail prices for grain and edible oil rations in urban areas by 20.9% and 39.2% in 1991 and 1992 respectively. These measures made the rationed prices for grain and

edible oil equal to procurement prices and the government was only responsible for subsidizing the associated marketing costs. By the end of 1993 almost all cities abolished the rationing system and food coupons, and the state owned-and-run grain enterprises in urban areas started other commercial businesses. For the producer, the government declared the end of fixed prices for "contracted purchasing" in 1993. The farmers were still obliged to sell a quota of their grain to the government, but the purchasing prices used by the government were at the market level. As before, after fulfilling their delivery obligations, farmers were permitted to sell surplus agricultural products on the free market.

However, the government did not announce clearly what market prices should be used for procurement quotas and by what date the farmers had to fulfill their delivery obligations. At the same time, due to the over-heated economy and increased investment in a large range of projects, money was supplied excessively and rapid inflation reappeared. In 1993, there was a 13.2% increase in the general retail price index (Guo, 1999). Anticipating higher prices, the farmers were reluctant to fulfill their grain quotas. At the same time local governments in grain surplus areas prohibited grain exports to enforce the "quota delivery first" policy, but their real objective was to cut procurement costs. This led to a cut in grain supply. There was thus a shortage in grain. In late 1993 grain retail prices in urban areas increased significantly, and the general retail price index also increased - 21.7% and 14.8% in 1994 and 1995 respectively. To solve this problem the government re-imposed controls on urban grain retail prices, and in some areas, even food coupons were reintroduced.

The market price increase and the decline in grain production in 1994 spurred the government to use more administrative measures to control grain markets and production. At the end of 1994 the government re-emphasized that its channels were the only ones available in cotton marketing. Non-government enterprises were not allowed to buy grain directly from farmers, especially when the contracted purchasing quota had not yet been fulfilled. A "temporary

blockade" on rice and corn exports was imposed to increase the domestic grain supply in late 1994.

Following the grain market crisis in 1994, a new system called Provincial Governor Responsibility System (PGRS) was introduced. Provincial governors were asked to take responsibility for grain production and supply in their areas of jurisdiction. The goal of this system was to reach regional grain self-sufficiency. At the same time, the government raised the purchasing prices for agricultural prices significantly, 39.9% and 19.9% respectively in 1994 and 1995. Higher purchasing prices and the PGRS led to a new peak of grain production - 504.54 million tons in 1996.

In 1997, the GVAO reached 2,376.40 billion RMB *yuan* in nominal terms and increased by 7.1% per annum in real terms. The four sub-sectors developed unequally, as farming and forestry grew at 4.9% and 5.6% respectively, whereas animal husbandry and fisheries increased at 10.4% and 13.7% respectively. The farming share in the GVAO declined further, from 62.5% in 1988 to 58.3% in 1997, and the fisheries share grew significantly, from 5.5% in 1988 to 9.9% in 1997. During this stage, although the purchasing price increased by 9.6% per annum, rural households' net incomes grew by only 3.9% per annum, because the general retail price index increased by 9.4% per annum. In 1997 the net urban household income was 2.47 times larger than the rural one, and the gap between urban and rural households incomes had widened even further.

2.3.4. The Fourth Stage (1998-present)

In 1998, the new central government led by Premier Zhu Rongji formulated comprehensive reform plans to establish a market economy. These plans included reforming the banking system, improving state-owned enterprises' performance, reducing by half the number of government officials, accelerating the negotiations for WTO entry and reforming the grain

marketing system. Influenced by South-East Asia's financial crisis, China's economy slowed down compared to the previous seven years, when it had grown by 11.2% per annum. The growth rate of GDP in real terms was 7.8%, 7.1% and 8.0% respectively in 1998, 1999 and 2000, averaging 7.6% per annum.

The GVAO reached 24915.58 billion RMB *yuan* in nominal terms in 2000. The growth rate of GVAO in real terms was 4.8%, and the two sub-sectors of the GVAO, animal husbandry and fisheries, had slowed down compared to the previous three stages, growing by 6.1% and 7.5% respectively in 1998—2000. In 1998 grain production reached a new record, 512.30 million tons. With a series of good harvests, the supply of grain was greater than the demand, and that made selling grain difficult. The purchasing prices of agricultural products decreased over this period, by 8.0%, 12.2% and 3.6% in 1998, 1999 and 2000 respectively. Responding to the price signals, farmers reduced the sown area of grain by 1.31% per annum. Throughout the economy the total demand for commodities was very weak, and the general retail price index fell by 2.4% per annum. The net income of rural households grew slightly, by only 3.4% per annum. In 2000, the net income of urban households was 2.79 times as large as that of rural ones. Thus the gap between urban and rural household incomes widened yet again.

As stated previously, market forces had an increasingly important impact on agricultural production and marketing. However, the new policy designed in 1998 to solve the problems of the old grain marketing system involved government planning measures, not a reliance on market forces. The government undertook to buy all surplus grain which farmers presented for sale at a guaranteed price. Grain could be bought only by state-owned grain enterprises, and all private grain enterprises were banned from buying farmers' grain. The government wanted to monopolize all grain purchases and sell it at a higher price to compensate the state-owned grain enterprises' marketing costs and to reduce subsidies for them. Without a

comprehensive understanding of grain production and marketing and without good planning, the new grain marketing system was not implemented successfully.[14]

From early 2000, the government permitted certain economic experiments to occur in some provinces. Farmers in Shanghai city, Jiangsu, Guangdong, Fujian and Zhejiang provinces were permitted to sell their grain to any enterprises, either state-owned or private. The sown area plan was in fact cancelled in these five provinces, which were grain consuming regions and they had to import grain from other provinces. In these regions, farming was not the main income source for farmers; the more developed TVEs subsidized agricultural production. The new experiments in these richer areas had no effect on China's grain production, and the feasibility of extending this experiment to the whole country in the near future was debatable.

2.4. Summary of China's Experiments in Agricultural Reform since 1978

Although the comparative advantage development strategy was adopted gradually and the reform direction is market-oriented, the reform is still without a well-defined plan. Many implemented measures were chosen at random with bureaucratic or intuitive appeal. For example, from 1993 there was a shortage of grain supply. In 1994, the central government increased the purchase price of grain by 39.9% to stimulate grain production. The policy of increasing the purchase price of grain was declared in June 1994, but farmers could not respond to the new price because cropping had finished by then. Instead of increasing, the output of grain decreased by 11.39 million tons in 1994. In 1995 the government increased the purchasing price of grain by 19.9%. Responding to or stimulated by signals of the steadily rising purchasing prices of grain, farmers increased their grain production. A series of good harvests resulted and surplus grain could be stored.

[14] This new round of reform for the grain marketing system was designed jointly by the Department of Agriculture in the State Planning Commission and the Second Secretariat of the General Office of the State Council. Before its declaration, even the Minister of Agriculture did not know the contents. After its declaration, some economists and officials criticized this policy and thought it was unfeasible.

Market forces consequently became more decisive in Chinese agriculture. China's market-oriented reform pointed to the direction of further reform. However, the central government was reluctant to give up industrialization at the cost of agriculture. When faced with any kind of difficulty in the process of reform, the government would first respond by using administrative measures rather than market mechanisms to solve economic problems. Each round of bad reform was followed by many backward measures that worked against the free market.

With the gradual adoption of the comparative advantage development strategy instead of heavy industry, China's economic reform started by allowing micro-units to share newly produced profits. The improvement in the micro-level incentive mechanisms created a new stream of resources. Micro-management units obtained the right to make some profits, and asked for the subsequent reform of the resource-allocation mechanism. Moreover, motivated by profit, these micro-management units allocated more resources under their control to the suppressed labour-intensive industries rather than to capital-intensive industries, leading to a further increase in social wealth. Due to this increase in wealth, when the process proceeded logically to reforming the macro-environment, it was possible for the government to subsidize vested interest groups. At first, the government subsidized urban communities by keeping the retail prices of agricultural products unchanged or stable. When urban people's incomes increased, the government increased the retail price of grain accordingly to reduce its budgetary burden. Now, the government only subsidizes the associated marketing costs to support the state-owned grain enterprises.

CHAPTER 3

RESEARCH PROBLEMS AND DATA RESOURCES

3.1 Introduction of Research Problems

As described in Chapter 2, after the abolition of the commune system and the introduction of the Household Responsibility System in the early 1980s, the household became the basic unit of agricultural production and sale. With the gradual spread of the comparative advantage development strategy, farmers were entitled to have some decision-making power regarding production and sale. With a developing free market and increased education levels, the farmers could employ the resources for agriculture in response to market signals and government policies. Since each household was the basic unit of agricultural production and sale in China, the use of household survey data to examine some problems in the reform process in the agricultural sector is appropriate. In this thesis, relevant issues will be examined using aggregate data.

Four problems that have arisen in the agricultural sector will be examined in this thesis. The first is the problem of the Household Responsibility System (HRS). After the abolition of the commune system, the basic unit of agricultural production was the household and land was distributed according to the amount of labourers in each home. Implementing the HRS encouraged land fragmentation, which adversely affected agricultural production. Previous research by other economists highlighted the positive relationship between plot size and agricultural output in China. Chapter 4 will discuss whether the adoption of the HRS could lead to a decline in agricultural production by using household survey data. An evaluation of the feasibility of HRS in the future can then be provided.

The second problem is the regional comparative advantage in agricultural production and evaluating the Provincial Governor Responsibility System (PGRS). China is a large country and there is regional variation in comparative advantage in agriculture. Therefore one policy for the whole country would not be suitable due to so much regional variation. Since 1994, in order to increase the grain output to meet increasing demands, the PGRS was implemented. The goal of the PGRS was to achieve regional or provincial self-sufficiency in grain, and therefore grain self-sufficiency for China as a whole. The main feature of this policy was to solve the problem of grain supply by using administrative measures, but they did not take into account the regional comparative advantage of agricultural production. In Chapter 5 the aggregate data will be analysed to evaluate this system.

The third problem is the grain marketing system. As described in Chapter 2, since 1985 the main focus of agricultural reform has been to change the grain marketing system. In 1998 a new round of reforms in the grain marketing system began. This new policy was not well-planned and was criticized by many economists and officials. In Chapter 6 household survey data will be used to study the effects of the new grain marketing system on each household's grain sales. Since 2000 experiments in grain marketing reform had begun in some coastal provinces which import grain from other provinces; then the experiment was extended to inland provinces which export grain. The purpose of these experiments was to open the grain market and to subsidise farmers directly. These experiments will be analysed using case studies, and an analysis of past experiences and the current economic situation in China.

The last problem is to research the Chinese farmers' current incomes, especially the wide gap in incomes that exists between rural and urban residents, and to provide some policy choices to increase farmers' incomes. Since the gradual implementation of the comparative advantage development strategy to boost industrialization, how to increase farmers' incomes and

alleviate this disparity between rural and urban people is one of the important tasks for policy-makers. This is because it is feared that such a wide income gap will lead to social instability. In Chapter 7, the structure of farmers' incomes will be examined by using the household survey data. In the same chapter, a comparison will be made using the household survey data in the same areas for 1993-1995, to new aspects of farmers' incomes after the mid-1990s. Policy recommendations of how to increase farmers' incomes will be provided in the context of China's recent entry into the WTO.

There are two categories of data used in this thesis. One is the aggregate data and the other is the household survey data. In addition to the common problems of studying economic concepts and issues, this data involves some difficulties in assessing China as a developing country. In this chapter, it is first necessary to explain the aggregate data, and secondly, outline the nature of the household survey data.

3.2. Some Problems Relevant to the Aggregate Data

In this thesis, all of the aggregate data comes from various issues of the *Statistical Yearbook of China* and *Rural Statistical Yearbook of China*, edited by the China State Statistical Bureau. In most developing countries, statistics-gathering networks are not well developed and some officials lack professional knowledge or expertise in this area of economic management. Consequently, the values for some variables are consistently under-reported or over-reported. In China this problem may be very serious. Some CCP cadres who are keen to exaggerate their performance in order to get promoted tend to report inflated data. The phenomenon of reported data being full of "water" is very common, especially in the more remote and poor regions. In some areas local cadres deliberately exaggerate their achievements to get

promoted.[1] Some economists have also raised doubts about the reliability of China's official statistics (Rawski, 2001).

On the other hand, the phenomenon of intentionally underestimating statistical values is common too. The personal experience of the author in the Ministry of Agriculture is relevant to south China where there are richer provinces, such as Guangdong, Hainan, Fujian, Zhejiang and Jiangsu. The cadres in China's richer regions tend to underestimate the data. For example, this situation can be observed in Zhejiang, where private enterprises have developed very quickly and now take a greater proportion of local GDP, and in Guangdong province, where joint ventures have developed. Private business people are able to bribe cadres to underestimate the enterprises' performance in order to evade taxes. At the same time local cadres underestimate business data so that they can withhold some taxes that should go to the government, and use them for local construction projects or even enrich themselves.

The practice of underestimating data, especially in Zhejiang and Guangdong provinces, is very common in other prosperous regions, and there are many reports about this issue in China's newspapers. The China State Statistical Bureau realizes these problems, and adjusts the reported data from lower level statistical institutes[2] (Zhou, 1993; Cai and Wang, 2002). Most of the aggregate data from the China State Statistical Bureau can be accepted as reliable.

3.3. Notes on the Household Survey Data

During 1993-1995 the Chinese Economies Research Centre at the University of Adelaide and China's Department of Policy, Reform and Law, Ministry of Agriculture (MoA), jointly designed and conducted an annual sample survey of about 1000 households in five Chinese

[1] China's people sometimes say *shu zi chu guan yuan* ('the statistical value produces the cadres'). This means that the higher the statistical values, the higher the level the cadres reach because the development of local GDP is the only criterion to evaluate cadres' performance.

[2] According to the author's experience, the data from the poorer regions would be reduced, and those from the richer regions would be increased. The adjusted statistical values from each region are based on statistics officials' experience and the survey.

provinces: Jilin, Jiangxi, Guangdong, Sichuan and Shandong. This household survey was sponsored by the Australian Centre for International Agricultural Research (ACIAR). The survey focused on China's grain production and marketing for 1993-1995. A large database was established which contains cross-household data on population, labour, land, grain production and marketing, food consumption, incomes and related policy issues. After this initial household survey, China's grain production, marketing system and related policies developed rapidly.

The household survey that was conducted in 1993-95 continued in 1999-2000. Due to limited funds Henan province was selected instead of Guangdong province, thus the household survey was carried on in Jilin, Jiangxi, Shandong, Henan and Sichuan. The survey indicators were the same as the previous ones so that some comparative studies between five provinces could be made. The explanation for regional differences among the selected provinces and their individual positions within the national economy generally and the grain economy in particular, are explained below.

3.3.1. Choosing the Survey Sites

In Table 3.1 comparisons of the five provinces in terms of national statistics for 1998 are presented. In terms of population, Henan was the largest but its per capita arable land (0.073 ha) was below the national level (0.104 ha) but above the levels for Jiangxi (0.054 ha) and Sichuan (0.054 ha). Of these provinces only in Jilin province was the per capita arable land (0.154 ha) above the national level. In terms of population, Shandong was the second largest. Its per capita arable land (0.075 ha) was slightly above the level of Henan. In terms of GDP, Shandong (716.22 billion RMB *yuan*) was the highest, but its agricultural share of total GDP (16.98%) was the lowest and below the national level (18.71%). Its per capita GDP (8,104 RMB *yuan*) was the highest and above the national level (6,251 RMB *yuan*). Both the percentage of agriculture in total GDP and per capita GDP of the other four provinces were

above the national level, which signified that agricultural production was very important in their economies. Jilin's GDP (155.78 billion RMB *yuan*) was the lowest. On the other hand, its agricultural share in total GDP (27.57%) was the highest.

From 1989 to 1998 the national annual growth rate of GDP was at 9.24%, which was just above that of Jilin (8.77%). The growth rate in Shandong was the highest, 12.74%. Table 3.1 indicates that in Jilin 44.21% of the total number of workers were engaged in agricultural production compared to 49.80% nationally. There were many large- and medium-scale state-owned enterprises. Since the early 1990s, it was very common for state-owned enterprises to perform badly. Thus, it emerged that the GDP and its annual growth rate in Jilin province were the lowest among the five provinces. In terms of agriculture's share of employment, Sichuan (62.30%) was the highest and above the national level. Its per capita GDP (4,305 RMB *yuan*) was the lowest of the five provinces. The provinces also differed in terms of arable land per labourer, the ratio of grain to non-grain sown area and the major type of grain produced (see Table 3.2). The data for 1998 is presented in Table 3.2 to show these differences.

Jiangxi and Sichuan provinces specialized in rice production, Shandong and Henan specialized in wheat production, while Jinlin and Shandong specialized in corn production. In Jilin, 59.21% of the sown area was used in corn and its share in grain was 47.87%. In Jiangxi, 82.39% of the sown area for grain was planted with rice, and rice output constituted 91.62% of the grain output. Shandong province specialized in wheat and corn production, using 48.95% and 34.19% of the sown area for their cultivation, and its output was 47.48% and 36.43% in grain output respectively. Henan specialized in wheat production, with 39.48% of the total sown area. The output of wheat was 51.72% of total grain output. In terms of sown area, 29.56% and 25.34% of sown areas of grain were for rice and wheat in Sichuan province, respectively. But in terms of output, 46.70% of grain output was rice and wheat's share of

the total grain output was 17.08%, which suggests that there was no comparative advantage in wheat production in Sichuan province.

The position of each province and of the five provinces as a whole in China's grain production system is reflected in the following figures. In 1998, 19.95% of China's rice output was produced by Jilin (1.94%), Jiangxi (7.18%), Shandong (0.70%), Henan (1.86%) and Sichuan (8.27%). 43.01% of China's wheat output was produced by Jilin (0.10%), Jiangxi (0.08%), Shandong (18.45%), Henan (18.90%) and Sichuan (5.48%). 33.71% of China's corn output was produced by Jilin (9.03%), Jiangxi (0.07%), Shandong (11.69%), Henan (8.24%) and Sichuan (4.69%). These five provinces are the main grain producers.

The degree of cropping diversification varied regionally and may indicate not only differences in the degree of development and marketing, but also the nature of each province's resources. Compared to the national level, the five provinces may to some extent represent three different regional cases. As shown in Table 3.2, in 1998 the grain share in the total sown area was above the national level in Jilin and Sichuan; below the national average in Jiangxi; and about the same as the national level in Shandong and Henan.

3.3.2. The Sampling Criteria, Procedures and Sample Size

The household survey was mainly based on the existing crop-cost survey conducted annually by each province under the instructions of the Ministry of Agriculture (MoA).[3] The sample counties, villages and households were selected from qualifying population of counties, villages or households. The qualifying county, village or household had to produce one or more of the following crops as its major crop(s): rice, wheat, corn, soybean, rapeseeds, sugar cane, sugar beetroot, peanut and cotton. The samples of this household survey were only selected from the population of qualified counties, villages or households for grain production,

[3] The crop-cost survey was originally organized by China's MoA in the early 1980s.

and any other non-grain or non-agricultural production was not included. The chosen counties should be able to represent the average level of the province's grain production to which they belong, the selected villages should be able to represent the average level of grain production of their county, and the selected households should be able to represent the average level of grain production for their village. The income level or level of local economic development was not considered in determining the sampling procedures.

The original sample plan of the household survey jointly designed and conducted by the University of Adelaide and MoA included 4 counties from each of the five provinces, 10 villages from each county and 5 households from each village. Therefore, the total number of counties was 20, the total number of villages was 200, and the total number of households was 1000. If some villages did not have enough households to satisfy the sampling criteria, either more households in other selected villages were substituted or more villages were chosen. In general, the total number of households of a selected county would not be less than 200. When the data is used in the following chapters to analyse each research problem, it would have been inspected and some data with errors should be deleted so that the number of households suitable for the study would be less than 1000.

The aggregate data and household survey data for Jilin, Shandong, Jiangxi, Henan and Sichuan provinces in 1999-2000 will be used to examine productivity in grain, regional comparative advantage in agriculture, trade in agricultural products and farmers' incomes. For the sake of comparison, some household survey data for the provinces of Jilin, Shandong, Jiangxi, Guangdong and Sichuan from 1993-1995 will also be referred to.

Table 3.1: Basic Economic Statistics of Jilin, Jiangxi, Shandong, Henan and Sichuan in Comparison with the National Economy, 1998

	Population (millions)	Agriculture's Share of Total Population (%)	Arable Land (million hectares)	GDP* (billion RMB *yuan*)	Agriculture's Share of Total GDP * (%)	Annual Growth of GDP, 1989-1998 ** (%)	Number of Workers (millions)	Agriculture's Share of Employment (%)
Nation	1,248.10	75.33	130.04***	7801.78	18.71	9.24	699.57	49.80
Jilin	26.03	56.86	4.00	155.78	27.57	8.77	12.40	44.21
Jiangxi	41.91	78.82	2.28	185.20	24.32	11.26	20.94	46.58
Shadong	88.38****	74.41****	6.65	716.22	16.98	12.74	52.88****	47.26****
Henan	93.15	82.35	6.83	435.66	24.59	10.69	50.00	49.94
Sichuan	83.16	82.44	4.49	358.03	26.29	9.51	45.34	62.30

*Notes: * Value is based on current prices.*
*** Growth rate is based on official "comparable prices".*
**** Data comes from the 'Communique of main data on land use survey' published by the Ministry of Land and Resources, State Statistical Bureau and National Agricultural Census Office of China. The arable land is data for October 31, 1996.*
***** This data is from the Ministry of Security.*

Source: Statistical Yearbook of China, 2000, SSB, Beijing: China Statistical Press, 2000; Comprehensive Statistical Data and Materials on 50 Years of New China, SSB, Beijing: China Statistical Press, 2001.

Table 3.2: Basic Statistics on Grain Economy: Jilin, Jiangxi, Shadong, Henan and Sichuan in Comparison with the National Economy, 1998

	Total Sown Area (million hectares)	Share of Grain Area in Total Area (%)	Share of Rice Area in Grain Area (%)	Share of Wheat Area in Grain Area (%)	Share of Corn Area in Grain Area (%)	Total Grain Output (million tons)	Share of Rice in Total Grain Output (%)	Share of Wheat in Total Grain Output (%)	Share of Corn in Total Grain Output (%)
Nation	155.71	73.08	27.43	26.17	22.18	512.29	38.79	21.42	25.95
Jilin	4.06	87.83	12.81	1.95	67.41	25.06	15.38	0.44	47.87
Jiangxi	5.80	58.83	82.39	1.99	0.85	15.56	91.62	0.59	0.56
Shandong	11.14	73.02	1.97	48.95	34.19	42.65	3.26	47.48	36.43
Henan	12.57	72.43	5.49	54.51	23.63	40.10	9.22	51.72	27.34
Sichuan	9.71	75.53	29.56	25.34	18.53	35.20	46.70	17.08	17.70

Source: Statistical Yearbook of China 1998, SSB, Beijing: China Statistical Press, 1998

CHAPTER 4

HOUSEHOLD RESPONSIBILITY SYSTEM AND LAND REFORM

4.1 Introduction to the Household Responsibility System

From the collectivization movement in the 1950s to the introduction of the Household Responsibility System (HRS) in the late 1970s, the production team system was the basic farming unit in China. In this system, a farmer's contribution to the production was assigned as a work point.[1] At the end of each year, part of the production team income was set aside first, for paying the taxes and making contributions to the public welfare funds of the aforesaid production team. The rest would be distributed to farmers according to the share of their work points in the team's total work points. Due to the nature of agricultural production, perfect monitoring of the system was too costly to be feasible. Thus, work points did not accurately reflect each farmer's actual contribution to production. In general, all farmers in a team received roughly similar work points. Such a remuneration system seriously hampered farmers' incentives to work. Moreover, depriving the production team of the right to exit[2] further reduced a farmer's incentive (Lin, 1993). The consequence of this remuneration system was that the absolute shortage of agricultural products became a persistent and unsolved problem before the economic reforms. To solve these problems, HRS was introduced to promote farmers' incentives in agricultural production.

[1] The work point was assigned in different ways: one way was to pre-assign the work points to various tasks. After the farmer finished a task, he or she was paid the value of its work points. The other way was to group farmers into grades from six to ten. A farmer's total work points in a year equalled the product of his or her grade and the number of his or her working days in a year. A third way was to select a standard farmer from the production team and assess the work points of other farmers based on a comparison between his/her work and theirs (Carter and Zhong, 1988).

[2] The production team was asked to join the collective, and had no right to leave it. This was an important strategy to rein in the occurrence of free-riding.

The development of the HRS itself could be divided into three phases: the work-quota contract phase; the output-quota contract phase; and the responsibility contract phase. Every phase experienced nearly the same evolution from the contract with a group of farmers, to the contract with each individual farmer, and finally to the contract with a household. However, the three major modes in this evolution were the group work-quota contract, the household output-quota contract, and the household responsibility contract.

Under the group work-quota contract, the production team was assigned a certain work quota with pre-specified requirements for time, quantity and quality, and then the team would be rewarded or punished according to its performance. Compared with the original work style of the production team, the system reduced monitoring costs, eliminated the free-rider problem and promoted farmers' incentives. This was because quantity, quality, time and remuneration were clearly defined in advance and the formation of working groups was voluntary.

Under the household output-quota contract, a specific output quota and plots of land were assigned to a household. The household was responsible for delivering to the production team a pre-determined quantity of output. The output exceeding the quota would be given to the household or shared between the household and the production team. There were two differences between the household output-quota contract and the group work-quota contract. Firstly, the former type of contract encompassed not just a certain stage of the production process but the entire process. The difficult problem of assessing intermediate results in agricultural production was thus circumvented. Secondly, the unit of contract changed from a group of farmers to an individual household. The difficulties of monitoring farmers and preventing the free-rider problem from occurring were thereby circumvented.

In the HRS, land was assigned to each household according to its number of members, or to both its number of members and number of adult farmers.[3] The individual household was required by the contract to pay tax, fulfil the state's procurement quota, and submit to the production team a certain amount of public accumulation funds, public welfare funds, etc. After these obligations had been fulfilled, all the remaining output belonged to the individual household. The important difference between the household output-quota contract system and the HRS was that the unified income distribution across households in the production team no longer existed under the HRS.

As stated in Chapter 2, the HRS went through a phase of complete illegality, a phase of partial legality and a final phase of extensive promotion. During the years of the commune system, when agricultural production was in crisis, the HRS automatically and secretly appeared to help agricultural production to overcome the crisis in a short period of time. However, each time the government considered the system to be in violation of the basic principles of socialism, it would be banned. In the latter half of the 1970s when the national economy was on the verge of collapse, the HRS appeared once again. Although the government did not allow it publicly at the beginning, the existence of the HRS was tolerated. Because the HRS had played a positive role in solving farmers' subsistence problems in poor areas, the government further relaxed its policy concerning the HRS. In September 1980, the central government noted in 'Issues regarding further accelerating and perfecting the agricultural production responsibility system' (MoA, 1989) that, "in those remote mountains, poor or backward regions... if there is a demand for adoption of the household output-quota contract system, the government should support the general public demand. They can adopt either the household output-quota contract system or the household responsibility system."

[3] In most areas, the children did not receive any land; only adults over eighteen years of age could be allocated land.

Under this more lenient government policy, the share of production teams who adopted the household output-quota contract system and the HRS increased significantly. These systems simultaneously stimulated farmers' production incentives. In areas where the HRS was adopted, agricultural output increased considerably. When the government observed this, it further relaxed the restrictions on the adoption of the HRS in 1981 and in 1982, and entirely eliminated these restrictions in the end. In 1983, this micro-foundation reform was given an ideological endorsement (MoA, 1989). In 1984, the central government promulgated new measures to strengthen and perfect the HRS. These measures marked the completion of HRS reforms in rural areas.

In general, the HRS and other similar modes appeared autonomously in some rural areas and solved some problems concerning agricultural production. The government connived at their existence as a temporary measure, but basically believed that they did not accord with the principles of socialism. Once agricultural problems were alleviated, these modes would be banned officially. At the end of the 1970s, with the downfall of the Gang of Four and the end of the Cultural Revolution, extremism disappeared gradually. China instead began to emphasise economic development, not radical political ideology. In this situation, due to their ability to stimulate farmers' incentives and solve agricultural problems, the HRS and other similar strategies in some poor areas were accepted by the policy-makers. They were then extended to the whole of China and replaced the commune system as the basic system of production in rural areas. The process of this reform was a 'bottom-up' approach, from the lowest levels of China's rural communities to the government apex. The central government was passive in accepting it, but actively extended it to totally replace the original system.

It was shown in Chapter 2 that from 1978 to 1984, when the HRS took hold, China's agricultural economy developed very quickly. This was the period of the most rapid agricultural growth since the establishment of Communist China in 1949. The HRS was the

main reason for the rapid agricultural growth occurring during this period. Lin's study (1992) showed that 46.89% of the total output increase in this period could be attributed to the HRS. Although other factors, such as the increase in procurement prices of agricultural products and the decrease in the prices of agricultural inputs, also contributed to growth, none made as significant a contribution as the HRS did.

The HRS became the driving force behind agricultural growth in that period primarily due to its method of income distribution. After submitting the required amount of money to the state and the collective, all residuals belonged to individuals. Thus, individual households became the residual claimants. This system stimulated a farmer's desire to produce more outputs in order to improve his or her own lot. In this way, China was able to exploit an abundant agricultural labour force to its own comparative advantage.

The HRS was a micro-management reform in those rural areas with a history of having a highly autarkical economy.[4] Its evolution proceeded in a path-dependent manner, influenced by prevailing ideology and economic reality in China. Among them, the egalitarian distribution of factors of production among households was the most remarkable. This egalitarian distribution was evidenced in the small and scattered plots of agricultural land that each household owned. In China's very poorly developed economy in which the differentials of land rent were very difficult to estimate accurately, the simplest and most feasible way to break up the collective that induced the problems of free-riding and lacking of production incentives was the equal distribution of factors of production. The benefits of this selection significantly exceeded its costs and, in practice, it was the only acceptable option.

[4] Autarky has been the main characteristic of China's economy, ever since the first Emperor of the Qin Dynasty (*Qin Shi Huang*) reunified China in 221 BC. Only in the nineteenth century, after the First Opium War (1840-1842) between China's Qing Dynasty and Britain, did the autarkical system slowly begin to collapse (see Huang, 2000).

Scarcity of resources makes competition inevitable. The conflict of competition must be settled in some manner. Alchian (1965) proposed that the establishment of property rights replaced competition by destructive violence with competition by peaceful or orderly means; therefore the rules that restrained competition for resources were known as property rights. Conceivably, if resources were always more than sufficient so that there was no need for competition, property rights arrangements would serve no purpose. Land is a resource and therefore the scarcity of land makes competition inevitable. Before the economic reforms of 1978, the commune system was based on one kind of property rights regarding land ownership. All land was to be owned collectively. The HRS is also a kind of property arrangement in which land is still owned collectively. Thus, the HRS did not change the ownership of arable land. Lin, Cai and Li (1996) argued that the HRS could only be viewed as a leasehold system. However, the principle of distribution ordained that all marginal output belonged to the farmers themselves. This principle of distribution is similar to that of a fixed-rent system compared with team production, where farmers were entitled to additional outputs (similar to a corvee system), or the contract system of "allocating all products according to a fixed proportion" which only awarded part of the additional outputs to the farmer (similar to a shared-crop system). The method of income distribution in the HRS provided a closer link between labour effort and reward. Therefore, the farmer was more motivated to work.

4.2 Land Fragmentation due to the Household Responsibility System

As described in the first section of this chapter, since the early 1980s the Household Responsibility System (HRS) in China's agricultural system has meant that the household became the basic unit of production. The introduction of the HRS did not lead to any change in the operational scale on per labour base. In other words, the HRS only led to much higher visibility of the excessively small operational land scale, which was not visible in the commune system. In order to distribute land equally among farmers and to indicate the plots

that belonged to individual households, land plots that were owned and operated collectively were divided into smaller pieces. Furthermore the proportion of farm land used as a boundary was increased. Land fragmentation with small scale and multiple plots resulted.

Land fragmentation, in which a household may operate more than one plot of land, is very common in a less developed agricultural system. Land fragmentation may be the result of either tradition or land scarcity. Farmers may acquire scattered holdings because they have to accept available plots of land that are dispersed from each other but within reasonable distance from their homes. Admittedly, if the private costs of land fragmentation exceeded its private benefits, land consolidation would increase spontaneously, unless there were no land markets to provide farmers with opportunities to do so. Therefore, the persistence of land fragmentation does suggest either: (1) that land markets do not exist; or (2) that the detrimental effects of land fragmentation are not perceived by farmers (Nguyen, Cheng and Findlay, 1996).

One private benefit of land fragmentation that has received most attention is risk reduction. Because their plots of land are scattered, farmers can reduce the risk of loss from flood, drought, fire and other perils and diversify their crop mixtures so that the total output increases according to different growing conditions. However, this benefit in terms of risk reduction should be compared with the cost in terms of some possible loss of output, which may arise due to increased travel time between plots of land, land used for boundaries and access routes, reduced scope for irrigation and soil conservation, and increased potential for disputes between neighbours (Lewis, 1959). Before the establishment of the PRC, there was no tradition of right of primogeniture. Parents had attempted to provide their heirs, i.e. their sons[5] equally with land of similar quantity. Land fragmentation was very common and arose voluntarily.

[5] Traditionally in China, daughters did not have the right to inherit their parents' property. Even if there were no sons, parents

After 1949, the commune system was established gradually in China's rural communities. As described in Chapter 2, this system was premised on two propositions. Firstly, if farmers could collectively own and manage land and if incomes could be distributed according to their contributions, they would have greater incentive to work than under the old landlord-tenant system. Secondly, the communes would be able to achieve economies of scale.

The first condition in the first proposition was fulfilled, but the second condition failed miserably. In the commune system, commune cadres might be regarded as the principals and farmers as the agents. It was difficult to distinguish principals from the agents. The cadres had few incentives to supervise farmers' work because most of them were paid by the state. Their promotions depended more on their relationship with the higher cadres and so-called revolutionary spirits than on their performance as supervisors of agricultural production. On the other hand, due to the nature of China's agricultural production, farmers often worked on different tasks at different times, so no efficient supervision system was possible. At the same time, economic incentives were not allowed and only some rewards of a political nature, such as entry to the Chinese Communist Party, were possible and scarce, and the benefits were certainly doubtful. The commune system thus led to a free-rider problem. The income of a farmer in the commune did not depend on the quantity or quality of his or her contribution. He or she could benefit from other members' efforts. In this system, rational behaviour for individual commune members who could not control the outcomes would be to minimise his or her own work. In the end, it was a negative sum game — the result of what could be called the prisoner's dilemma.

The second proposition, concerning economies of scale, was correct in theory, but there were probably few economies of scale in China's agriculture at that time. If they had existed they

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would adopt a young relative with the same surname as a stepson to inherit the property.

were not the result of the commune system. Even if there were some economies of scale and externalities in rural infrastructure projects, such as pest control and irrigation, the enormous losses due to the poor planning and implementation of such projects might have overwhelmed any potential gains. Poor planning and implementation under the commune system were inevitable. Such poor performance partly resulted from managerial inexperience, but the fundamental problem was that no one took the responsibility for the success or failure of these projects.[6]

In 1978, when the commune system was replaced by the HRS, land fragmentation took place for a second time since the establishment of the PRC. Land was divided into many plots according to its quality and the number of units of "full labour"[7] in a commune. The plots of land were distributed to individual full labour units in and each household. For example, in the household survey that was jointly designed and conducted by the MoA in China and University of Adelaide in 2000, the average number of plots for production of rice, wheat and corn were 5.08, 2.39 and 6.88 respectively per household in these surveyed provinces. In China, while land was distributed according to full labour units, the household was the basic unit of operation on the land. Subject to the HRS, individual farmers had the right to use some plots of land but not own them. At the same time, there were no markets for land use, so farmers had little opportunity to consolidate their holdings even if they desired to do so.

Blarel et al. (1995) in their study of Ghana and Rwanda, questioned the importance of the economic cost of land fragmentation. They found that parcel size either had an insignificant effect on crop yield or was negatively related to yield. After elaborating on the possible benefits of land fragmentation, they concluded that policy-makers should be more focused on reducing the root causes of fragmentation that included: inefficiencies in land, labour, credit,

[6] Even recently, some of China's CCP cadres still say that lessons are learnt by paying money (*Hua Qian Mai Jiao Xun*). Inexperience is always the cadres' excuse for neglecting their duties.

[7] The adult man and woman were regarded as full labour (*Quan Lao Dong Li*). Children younger than eighteen years old and men and women older than 60 were not full labour. The conversion rate from children or old men and women to full labour differed regionally.

and food markets. Although Blarel et al. (1995) showed that land fragmentation had possible benefits, they failed to establish a direct link between land fragmentation and crop yield in places where labour was in surplus.

In their study of land fragmentation in China, Fleisher and Liu (1992), estimated a production function for rice-equivalent kilograms of grain output which included wheat, corn, rice, millet, sorghum, sweet potato, cotton, soybeans and peanuts, based on 1987-1988 data. They found that reducing the number of plots from their sample average of 4 to an average of 1 would raise total factor productivity by 8 per cent. In a more recent study of land fragmentation in China, Nguyen, Cheng and Findlay (1996) arrived at the same conclusions. They used what is known as the Cobb-Douglas production function to find a positive relationship between output and average plot size, meaning that land fragmentation in China did have an economic cost. Wan and Cheng (1999) also showed that land fragmentation led to inefficiencies in China's agricultural production.

In the next section, an econometric model is outlined to test the effects of land fragmentation by using the new household survey data, and calculation results are reported. In the last section of this chapter, conclusions about land fragmentation problems and some policy suggestions on how to reform the HRS further, are provided.

4.3 Model, Data and Results

Nguyen, Cheng and Findlay's study (1996) hypothesized that the plot size was positively related to output, and they chose average plot size, P (=S/N, where S is total land area per household and N is the number of plots per household) to examine the effect of land fragmentation on agricultural productivity for rice, wheat and corn. They used the household survey data conducted in Guangdong, Shandong, Jiangxi, Sichuan and Jilin provinces in 1993 and 1994. In their study, the Cobb-Douglas production function was used because this

function is the most popular and convenient, satisfying all the standard theoretical restrictions, and also has many other useful analytical properties. The Cobb-Douglas production function can be estimated using a tool such as ordinary least-squares because it is linear in the logarithms of output and inputs.

In this study, the Nguyen, Cheng and Findlay model was selected to research the same problem by using the household survey data collected in Henan, Shandong, Jiangxi, Sichuan and Jilin provinces during 1999 and 2000. It is hypothesized that the higher the number of plots of the individual household for the same area, the lower the output.

The production model established is as follows:

$$(1)\ Q = e^{c+a1D+a2E}\ P^{a3}\ S^{a4}\ CF^{a5}\ OI^{a6}\ LT^{a7}$$

which, taking natural logs, becomes

$$(2)\ LnQ = c+a_1D+a_2E+a_3lnP+a_4lnS+a_5lnCF+a_6lnOI+a_7lnLT$$

where:

Q: individual household's output per mu for each crop (*jin*), i.e., rice, wheat and corn;

D: dummy variable for annual weather conditions (0=1999, 1=2000);

E: educational level (taking a value of 1, 2, 3, or 4 respectively for no-education to primary school, junior high school, senior high school and beyond high school);

P: average plot size for each crop. P=S/N, where S is total land area per household and N is the number of plots per household. Given S, there is a perfect inversely proportional relationship between N and P, i.e., larger N implies smaller P and vice versa. Here, P is

selected because it is generally more meaningful to discuss the effects of land fragmentation in terms of the average plot size rather than in terms of the numbers of plots per household.

S: total land area per household used to cultivate the crop (*mu*). The number of plots that is determined by the different situations in different areas is not related to the total land area. There is thus no correlation between the number of plots and the total land area owned by the individual household;

CF: total weight of chemical fertilizers used for respective crop including urea, ammonium nitrate, ammonium carbonate and so on (*jin*); and the costs of manure are included in the other inputs;

OI: index number of other inputs; the other inputs include costs of seeds, farm manure, machinery irrigation, pesticides, crops protection and plastic film. In this study, the prices of other inputs in 1999 are substituted for the weights (see Varian, 1990, p. 129), so the Laspeyres quantity indices are given by

$I_{1999}= (p_1^{1999} x_1^{1999} + p_2^{1999} x_2^{1999} + \ldots\ldots) / (p_1^{1999} x_1^{1999} + p_2^{1999} x_2^{1999} + \ldots\ldots)$ and

$I_{2000}= (p_1^{1999} x_1^{2000} + p_2^{1999} x_2^{2000} + \ldots\ldots) / (p_1^{1999} x_1^{1999} + p_2^{1999} x_2^{1999} + \ldots\ldots)$

($x_1, x_2, x_3 \ldots\ldots$indicates the quantity of other inputs respectively.)

The index numbers of other inputs for 1999 thus are all 1.00.

LT: labour time used in ploughing, sowing, field managing and harvesting (working-day).

In this study, all data comes from the household survey in China jointly conducted by the Ministry of Agriculture (MoA) in China and the University of Adelaide during 1999-2000. All the unmatched household samples which contain obviously errant data had to be removed from the data set in order to satisfy the sampling criteria. The data set covers 1000 households

sampled from Jilin, Sichuan, Shandong, Jiangxi and Henan provinces, which represent the regional differences in grain production of northeast, north, southwest and east China respectively.

Subject to the availability of household survey data, in the study of the production function for rice, there is plantation of only Japonica rice in Jilin, of late Indica and Japonica rices in Sichuan, and of early and late Indica rices in Jiangxi. Concerning the study of wheat, spring wheat is planted only in Jilin province, winter and spring wheat is grown in Sichuan province, and only winter wheat is cultivated in Shandong province. And there is specialization in the production of wheat in Henan. Regarding the study of corn, only the data from Jiangxi province has been omitted.

Production functions are estimated for each of the major grain crops in the sample provinces: rice, wheat and corn. The main objective in this study is to examine the effects of land fragmentation on farm productivity in China and to provide land reform suggestions for policy-makers. Using the OLS (ordinary least square) method, results are shown in Table 4.1 below.

Table 4.1: Production Function for Rice, Wheat and Corn

	C	α_1	α_2	α_3	α_4	α_5	α_6	α_7	F	R^2
Rice	6.49	-0.002	0.02	0.09	0.78	0.05	-0.01	0.10	763.85	0.84
	(65.38)	(-0.11)	(1.94)	(7.26)	(22.54)	(2.18)	(-0.3)	(6.51)		
Wheat	5.02	-0.07	0.06	0.31	0.45	0.14	0.18	0.04	837.91	0.77
	(42.57)	(-2.56)	(3.09)	(12.84)	(7.36)	(8.56)	(6.71)	(1.75)		
Corn	5.27	-0.05	-0.01	-0.001	0.71	0.11	0.16	0.05	985.49	0.81
	(38.27)	(-1.66)	(-0.52)	(-0.06)	(18.30)	(4.72)	(7.29)	(2.05)		

Notes:
1. Number of observations for rice: 1133; for wheat: 1036; and for corn: 1141.
2. The values in the brackets are their t-values.
3. The coefficients are significant at 5% level.

The calculation results basically test the hypothesis that the more plots the individual household has, the lower the output will be. The results show that there is a significant positive relationship between average plot size and the output for rice and wheat, namely, the

negative relationship between the number of plots per household and the output of rice and wheat. The change in the output of corn with respect to the change in average plot size is not statistically significant. The estimated elasticity of output with respect to average plot size is 0.09 for rice and 0.31 for wheat. This means that dividing each plot of land into two halves, *cet. paribus,* would result in a loss of output by 9% and 31% on average for rice and wheat respectively. These results imply that fragmented land in China imposes significant costs in terms of productive output. The actual relationship between average plot size and farm output in rural China may be stronger than suggested by these empirical results. This is because there is a tendency for better quality land to be divided into smaller plots when land is allocated to each individual due to the adoption of the HRS in the late 1970s and early 1980s.

In comparison with other coefficients, the output elasticity with respect to total land area is the largest for all three crops (0.78 for rice, 0.45 for wheat and 0.71 for corn, and they are all statistically significant). The higher elasticity with respect to land compared with that for other inputs, such as labour time, chemical fertilisers, etc. for all three crops is a huge challenge for land-scarce China and its huge population. The elasticity of output with respect to chemical fertiliser input for all three crops is statistically significant (0.05 for rice, 0.14 for wheat and 0.11 for corn). The return to using fertilizer is better in this respect for wheat and corn compared with rice.

The elasticity of output with respect to labour time is statistically significant and positive for all three crops (0.10 for rice, 0.04 for wheat and 0.05 for corn). At the same time, the output with respect to educational level is statistically significant and positive for rice (0.02) and wheat (0.06), but is not statistically significant for corn. As discussed in the second section of this chapter, arable land is distributed according to the members of units of full labour rather than individual households. At the same time the unit of agricultural management is the household. In China, the earnings from growing crops are small compared to other

agricultural activities. Thus many labourers are increasingly working in other sectors of the rural economy to earn higher incomes. Every year there is a "labour tide" from the poorer provinces with less developed industries to the coastal areas for better job opportunities and higher incomes. It is said in China now that only the "army" of 'March 8', 'June 1' and 'September 9' plants the land: March 8 is International Women's Day; June 1 is Children's Day in the Gregorian calendar; and September 9 in the Lunar calendar is the Older People's Day. These days are used to represent women, children and older people respectively. In China, planting crops is still a labour-intensive process using much less technology than other types of industry, and the level of education in rural areas is generally low. However, the production of corn needs simpler labour skills in field management compared to rice and wheat, and thus the education level of people is not related to the output of corn.

There is no significant relationship between the output of rice and the index number of other inputs. But there is a significantly positive relationship between the output of wheat (0.18) and corn (0.16) and the index number of other inputs. In comparison with land, labour time and chemical fertilizers, the other inputs (such as manure and plastic film), on the production of rice are negligible.

4.4 Conclusions, Further Land Reform and Policy Suggestions

In China's rural society, there are too many farmers in respect to the cultivated land. Although the HRS stimulated farming productivity and improved overall agricultural production, there are many obvious drawbacks to this system. Most significantly, the HRS induces land fragmentation which in turn has created inefficiencies in agricultural production. However, the HRS can be improved.

In the early days when the HRS was widely promoted, not only the arable land but also the collective assets, such as tractors and other agricultural machinery, were distributed to each

household. Most collectives thus lacked the ability to provide the services required by agricultural production in individual households. The collective became only a nominal entity.[8] The agricultural infrastructures, the use of inputs and the marketing of products had significant externalities. To ensure that all agricultural households enjoyed the benefits of these externalities, cooperative arrangements were needed to provide these services to individual agricultural households. There was increasing demand for a cooperative management system for some activities to complement household operations. In general, the major activities of cooperative managements were to increase the scale of transactions so that transaction costs would fall, and to organize agricultural households to produce public goods that could not be produced by individual households. One example of such a management was the adoption of a mandatory labour contribution system to participate in irrigation projects. Some surveys (Lin, Cai and Li, 1996) showed that, in recent years, cooperative managements have become more extensive. Promotion of agricultural technology and provision of improved seeds and irrigation projects has resulted in remarkable growth. Cooperative managements for marketing staple agricultural products have also increased. Therefore, cooperative managements created conditions under which it was possible for individual agricultural households to benefit from the externalities and economies of scale. On the other hand, the problems of land fragmentation induced by the HRS have been difficult to solve.

According to the results in the third section, gains were made in land consolidation in China's agricultural production system. The generally observed negative relationship between the number of plots and output for the two major grain crops, rice and wheat, implied that land fragmentation reduces grain output. As discussed in the second section, there were many explanations for land fragmentation. With the institutional changes in the late 1970s and early

[8] Before the founding of the PRC, the core of rural society was the family (*jiazu or zongzu*). The family was not only connected through blood, but also implemented some local government activities such as education and law enforcement. After 1949 the commune replaced the role of the family. Since the reforms of the late 1970s, due to the household becoming the basic unit of production and collapse of collectivisation, the family has gradually resumed its traditional role in some rural areas. Where it has not, 'gangsterdom' appears to have filled the vacuum.

1980s, adopting a land fragmentation strategy was generally involuntarily in China and was brought about more by the rural cadres of the CCP than by farmers. In the late 1970s and early 1980s, following the total implementation of the HRS, land was allocated to units of full labour on the basis of land quality and quantity. The common practice was that all land in a township or village was first divided into a number of groups based on similar land quality. Then each full labour unit in either the township or village was allocated some plots of land. As the land was allocated to each full labour units swiftly, the rural cadres who were responsible for allocating land were less likely to consider the demand side of factors of land fragmentation. Moreover, since then there had been no markets for land use and households were never allowed to consolidate their plots of land (Gao, 1993). The absence of land transfer markets and the regulations concerning land adjustment in China resulted from the absence of clear ownership of land, as collectives still officially owned all farming land (Cheng, 1993). Therefore, land fragmentation was a common occurrence throughout China, and an inevitable result of the HRS.

The results in the third section implied that the costs of further fragmentation were more likely to be significant. Given the gradually decreased cultivated land area due to urbanization and industrialization and the pressure of a growing rural population[9], the already very small plots of land in many areas of China would be fragmented further (Chen, 1992). The results indicated that this tendency could be very expensive in terms of foregone output. The present situation in China regarding this issue suggests that avoiding the outcome would require more fundamental reforms of China's rural land system.

On the other hand, one phenomenon is very common in the coastal and richer provinces. Anhui province is poor and with little cultivated land, and Jiangsu province is rich and with

[9] In the early 1980s, a birth control policy began to be used in China. This meant that a couple was allowed to give birth to only one child. Due to the pressures of tradition, i.e. the more children the better, this measure is more difficult to implement in rural areas, particularly where educational levels are low. This is in stark contrast to the cities where people known as Dinks (Double Incomes, No Kids) are appearing. Therefore, some experts worry about the quality of China's population because the average educational level of rural residents is much lower than that of their urban counterparts.

advanced Township and Village Enterprises (TVEs). In Jiangsu province's rural areas, especially south of the Yangtze River, most rural labourers work in TVEs for higher incomes and they would be less likely to plant crops because the opportunities are better in non-agricultural occupations than agricultural ones. Given this situation, some farmers in terms of households from Anhui province came to work in Jiangsu's fields to plant crops. Sometimes, they work on the land of several households. In order to encourage them the farmers of Jiangsu province even provide some extra wages to the farmers from Anhui province. This practice is also common in Guangdong province. Many farmers from Jiangxi and Hunan provinces work on Guangdong farmers' lands. Some farmers from Sichuan province even plant crops in Xinjiang Autonomous Region.

According to Cheung (1969), three distinctive types of rights are associated with property:

(1) firstly, the right to use or decide how to use the resource, that may also be viewed as the right to exclude non-owners;

(2) secondly, the right to profit from the rent accrued from the use of and investment in the resource;

(3) thirdly, the right to sell or otherwise transfer the resource to others.

Cheung[10] pointed out that if these three conditions were allowed to be undertaken privately, even if the ownership rights were owned by the state, the problems concerning property rights would be easily resolved in China's reforms of property rights. In the HRS, the farmer has the right to carry out the first and second above-mentioned conditions, but has no right to the third, i.e. the right to sell or otherwise transfer land to other people.

[10] Quoted from the preface for the Chinese version of *The Theory of Share Tenancy: With Special Application to Asian Agriculture and the First Phase of Taiwan's Land Reform* (Beijing: Commercial Press, 2001, p. 33). The Chinese title is *Dian Nong Li Lun.*

Since the mid-1980s, the experiments involving redistribution of farmland among individual households has been undertaken with less administrative intervention in relatively developed parts of China (Pi, 1987; Wei, 1992). These experiments were expected to have a positive effect on farm productivity. This kind of experiment may produce another round of institutional innovations in rural areas. In some rural areas, especially in the richer coastal provinces, after the subsistence problem was solved and non-agricultural operations began to develop quickly and to occupy a higher share of the total national income, the costs of operating these exceptionally small-scale agricultural production activities on individual plots became too high. The disadvantage of egalitarian distribution of usufruct[11] became more obvious. This was reflected in the fact that some agricultural households, relying on non-agricultural work as their major source of income, let their land go idle. These problems in some areas automatically gave rise to the system that allowed contracted land to be transferred. The transfer of contracted land simultaneously transferred the rights and responsibilities that were specified in the contract of the HRS. In some well-developed regions, the opportunity costs of fulfilling the responsibilities were much higher than the benefits enjoyed.

To standardize the transferable land-contract system, some experiments involving the two-field system were tried in some areas. In this experiment, collectively owned land was divided into two sections – grain-ration plots and responsibility plots. Grain-ration plots were distributed according to the number of people in a household, whereas responsibility plots were auctioned. Unlike the egalitarian distribution of the usufruct of land, the two-field system changed the equal distribution of land into the equal distribution of land income. This method improved land allocation and enhanced the efficiency of land use. The two-field system was similar to the transferable land-contract system. The differences between the two systems, however, was that in the latter the collective management had only indirect right of

[11] Usufruct is a kind of right to use and enjoy the profits and advantages of something belonging to another as long as the property is not damaged or altered in any way.

control over the transfer of land contracts, which took place between the agricultural households. In the two-field system, however, the collective management directly set the criteria for allocating land to grain-ration plots and sanctioned the auction of responsibility plots.

Land consolidation induces not only gains but also costs and risks. As discussed previously in this chapter, the loss of crops in one plot caused by pests, floods and some other natural disasters is less likely to be alleviated by normal or better harvests in the other plots after land consolidation. Moreover, land consolidation promoted by the administrative orders without notifying or fully consulting the rural cadres and households, could adversely affect confidence in the household responsibility system; it would reduce household investment in land and agricultural production. The redistribution of land would affect the distribution of rural communities' incomes because in most rural areas incomes from agricultural production still predominate. Finally, the situation of having too many people in the agricultural sector on less land available for cultivation will have huge implications for land consolidation. The last two points are very important.

The experiments in land consolidation were undertaken in China's wealthier areas because there were higher household incomes in rural communities and many labourers had left agricultural work. To reduce economic costs even further, land consolidation in China should be undertaken with less administrative interference and based instead on farmers' interests and desires. In the poorer areas with less advanced TVEs, the HRS could still continue and sometimes - in order to maintain social stability - the land has to be fragmented further.

A major challenge to China's agricultural sector was how to transfer a substantial part of the huge labour force to non-agricultural work. In the past 23 years, due to rapid rural industrialization and urbanization led by market-oriented reforms, 100 million rural labourers

have moved from the agricultural sector to TVEs. Total employment in TVEs reached 128 million in 2000 (SSB, 2001). Migration from rural areas to the cities was restricted during the pre-reform and early reform periods, then increased significantly in the late 1980s partly as a result of relaxing the policy restriction and partly as a result of TVE growth slowing down – leading to employment pressures.[12] Most farmers migrated to urban areas without officially changing their household registration status (*Hu Kou*) to urban residents. The number of these people, the so-called floating workers (*Liu Ming* or *Mang Liu*), was not known. Based on the data from surveys, it was estimated by Wang (2002) to be 14 million in 1990 and approximately 47 million in 2000.[13]

From 1980 to 2000, the total rural labour force increased from 318 to 499 million people as a result of natural population growth. Therefore, in spite of the rapid rural industrialization and continued urbanization over the past two decades, the agricultural labour force has actually increased from 291 to 334 million. The growth rate of rural labour had decreased significantly due to family planning (birth control) and urbanization, although the rate still remained positive at 0.5% in the 1990s. It has been predicted that the rural labour force will grow at a small rate of 0.2% per year, and reach a total of 530 million people by 2010 (Wang, 2002).

While the natural growth of rural labour was slowing down, rural industrialization had also stagnated after the mid-1990s. Total employment in the TVEs sector grew at a high annual rate of 12% in the 1980s, but only 3% in the 1990s. The TVEs' employment reached its

[12] The migration from rural to urban areas is also influenced by local traditions. In some areas, farmers would rather die than migrate to other areas (*Ning Si Bu Li Xiang*). For example, Sichuan province is richer than Guizhou province and Guizhou people should migrate to Sichuan to find better jobs. However, Sichuan people migrate to Guizhou to work in service-oriented industries, such as restaurants. (This phenomenon was called *Chuan Jun Ru Qian*, by Wu Yixia, who was Governor of Guizhou province from 1996-1998). The author talked to Wu Yixia in his capacity as administrative vice minister of the MoA, during the author's travels to Guizhou in 1997.

[13] Major sources are a recent survey by the Department of Training and Employment of the Ministry of Labour and Social Security, and the Rural Social and Economic Survey team of the State Statistical Bureau (MLSS & SSB), 1999, and State Statistics Bureau (SSB), 1991. The samples of the former survey cover 179,450 rural labourers in all provinces except Tibet. Wang assumed that all the "floating workers" who were working outside their home county, and half of those who were working outside their home town but within their home county, were in urban areas and were excluded from the TVEs' employment statistics. The changes from 1998 to 2000 are estimated according to the average growth rate of "floating workers" from 1990 to 1998.

highest figure of 135 million in 1996, dropped in 1996 and 1997, and then slightly recovered to 128 million in 2000. Clearly, growth of the TVEs sector would be slower in an intermediate pace. The average 1.5% growth rate of TVE employment from 2001 to 2010 might be expected to reach a total of 149 million by 2010.

Rural-urban migration is unlikely to grow faster in the near future, due to the weaker demand on, and oversupply of, unskilled labour in urban sectors in recent years. A large number of urban workers in state-owned enterprises (SOEs) have been retrenched. According to Wang (2002), SOE employment declined by 30 million from 1996 to 2000, so the rate of transfer of rural labourers from rural communities to the cities will slow down. Nearly all the remaining rural labourers, after the deduction of those who had been employed by TVEs and migrated to urban areas, will remain in agricultural employment. This is because they are all entitled to having a small piece of cultivated land under the current HRS, and this gives them some insurance when they cannot find jobs in non-agricultural sectors. Therefore China's agricultural sector actually still works as an enormous reservoir for the rural unemployed labour force.

As the result of an oversupply of rural labour, farmers are not entitled to sell or transfer land to others. At the same time, the educational level of China's farmers is generally low, and they cannot understand their rights or responsibilities, so they are sometimes easily deceived by rural cadres of the CCP. If the land is allowed to be sold or transferred, the practice of land annexation would re-emerge and social stability would be endangered.

It is imperative that the HRS is made as perfect as possible in the future. The central government should adopt different policies for different regions. In the coastal regions where the cost of operating smaller plots of arable land has increased, land consolidation should be encouraged in order to achieve economies of scale in agricultural production. The adoption of

a two-field system should be extended to other richer regions. In the inland and western regions where job opportunities in other sectors are scarce, due to the underdeveloped TVEs and restrictive regulations on migrating from rural to urban areas, the HRS should be carried on further even though problems have been caused by land fragmentation.

CHAPTER 5

REGIONAL COMPARATIVE ADVANTAGE AND PROVINCIAL GOVERNOR RESPONSIBILITY SYSTEM

5.1. Introduction

In an article on global food security, Brown (1995) highlighted the concern over the ability to feed China through world grain markets. The world grain trade was about 200 million mt at that time. Brown forecast that China's imports would reach that level by 2030, or even possibly twice as much. Although some critics have challenged Brown's assumptions, the question of how to feed China and its population of more than 1.3 billion in the future remains an important issue for China's policy-makers.

Since the early 1960s, a strategy of local grain self-sufficiency was initiated after China suffered a series of famines that was due partly to natural disasters, partly to policy mistakes. Under this strategy, each province was required to produce its own grain to meet local demand. The exception was those areas where production of cotton and other cash crops was required by the central government to provide raw materials for industrial development. Communes were allowed to produce cash crops and conduct non-farming activities only after they had achieved self-sufficiency in grain. Since the production of grain was strongly encouraged by administrative measures, the development of other agricultural and non-agricultural activities in communes was impeded. This strategy often meant inefficient use of local resources, because communes might have to produce grain to achieve the goals set by the central government at the cost of other products in which they had a comparative advantage.

This policy of grain self-sufficiency at the provincial level was retained until the late 1970s. When China started its economic reforms, a comparative advantage development strategy instead of heavy industry-oriented development strategy was gradually introduced by the central government. Under this new development strategy, reforms focused on economic growth and efficiency. Grain self-sufficiency thus was no longer a target that every province was required to achieve. This left room for some provinces to develop their local economies according to their comparative advantages. At the same time, the abolition of the commune system and the establishment of the Household Responsibility System decentralized the management controls of agricultural production and made it possible for farmers to make their own decisions about agricultural production needs. Influenced by this development, the central government deregulated the market for most agricultural commodities. Farmers were allowed to sell their products on the free market. Nevertheless, as discussed in Chapter 2, this relaxation did not apply to grain. Although the controls had been loosened over time, especially in respect to surplus grain production, the central government continually insisted on the importance of grain production and self-sufficiency throughout China, and still controlled the purchases of quota grain being handled by state-owned grain enterprises.

As discussed in Chapter 2, China made a gradual transition from a planned economy to a market-oriented one. Market forces instead of administrative measures were slowly adopted by the central government in the management of agricultural and industrial production. During the early 1990s, grain production throughout China experienced fluctuations in growth (Yang, 1996). As discussed by Watson and Findlay (1999), the slow growth of grain output versus the continuous rise in demand induced prices hikes in late 1993 and early 1994. A number of administrative measures were taken to counter this crisis. In early 1995, the Provincial Governor Responsibility System (PGRS) was formally

proclaimed in order to manage grain production and marketing at the provincial level (Wang, 1996).

The responsibility of provincial governors in this system could be summarized as follows: (i) stabilizing grain-sown areas and increasing output within provinces; (ii) stabilizing the sources of grain and ensuring state procurements were fulfilled; (iii) stabilizing the grain security stock and gradually improving the reserve system; and (iv) stabilizing market supply and prices and managing the inter-regional grain trade (Diao, 1995). The goal of the PGRS was to reach grain self-sufficiency at the provincial level through administrative measures instead of market forces. In this way the comparative advantage in each province was less important and with little consideration for the central government. In other words, the central government focused on creating national grain security or self-sufficiency through local self-sufficiency at the provincial level, but at the cost of other agricultural products with comparative advantage.

As discussed by Watson and Findlay (1999), for many years state purchase and retail prices were lower than market prices. Even the large increases in state purchase prices in the early 1980s were also undermined by rising costs and free market prices (Zhang et al. 1996). As a consequence, for grain deficit provinces, inward transfers of grain through state planning channels at planned prices embodied a subsidy. Therefore, they preferred to obtain grain through state transfers rather than produce it themselves. In contrast, for provinces with a grain surplus, transferring grain outward at state prices meant forgoing profits that could have been obtained from selling grain on the free market (Watson, 1994). Thus, they were reluctant to sell grain through state channels.

At the same time, for farmers, the establishment of the Household Responsibility System generally allowed them to produce whatever they would prefer after they fulfilled the state grain quotas. Due to the distortions in the price system caused by lagging reforms in the grain marketing system, however, grain production had long been less profitable than many other economic activities. In some areas, grain production returns had been negative (Yang, 1994). Meanwhile, the rapid development of the Township and Village Enterprises provided opportunities outside the farming sector, resulting in a rapid increase in grain production costs. Farmers lost their enthusiasm for producing more grain. In some areas, farmers preferred to buy grain in the free market to fulfil the state purchase quota at a price that was higher than the state purchase price.

Due to the low profitability of grain production and lags in the grain marketing system reforms, the central government had to resort to administrative measures to achieve grain self-sufficiency at the provincial level, and overall national food security. In Chapter 2, it was noted that since the mid-1990s, due to the implementation of the PGRS and large increases in grain purchase prices, there was a series of good grain harvests, but the grain supply became excessive.

In 2001, China was admitted as a member of the WTO. Grain production therefore would face outside competition. The negotiations for China to enter the WTO necessitated some important policy changes. The most significant was the following. China accepted a tariff quota for grain imports at a 1% token tariff rate within the quota, which would amount to a total of 18.31 million tons in 2002, 20.2 million tons in 2003, and reach 22.16 million tons in 2004 (see Table 5.1 below). According to the results of the negotiations, the 22.16 million tons of tariff quota should be shared by the state and private trading enterprises, and any unused quotas by the state-owned enterprises should be transferred to private concerns.

Table 5.1: Import Quota of Grain, 2002-2004

(Million tons)

Year	2002	2003	2004
Rice	3.990	4.655	5.320
Wheat	8.468	9.052	9.636
Corn	5.850	6.525	7.200
Total	18.308	20.232	22.156

Source: WTO, 2001

Other significant results from the WTO negotiations included:

1. The above-quota tariff rates for major grains would be 65%, but for soybeans the above-quota tariff rate would be only 3%.[1]

2. The average tariff rate for all agricultural products would decline from 22% to 17.5%.

3. The average rate of domestic support for agricultural products would be 8.5%. Export subsidies would be zero.

4. Other non-tariff restrictions on importing agricultural products, such as licensing, were eliminated. This also included restrictions on importing wheat from the United States' northwest areas, which may have had TCK disease.[2]

It is not yet clear what the economic impact of this set of changes will have in the long term and there are still debates on the impact it will have. More detailed information in these particular areas is required to access the impact. However, it is clear that China's agriculture sector will face increasing competition. Policy-makers must take advantage of domestic and international market integration. Closer integration of both domestic and international markets in line with comparative advantage will contribute to more efficient use of resources in agricultural production and real incomes for farmers.

[1] The above-quota tariff is not important because the historical data on grain imports show little possibility that importing grain will exceed the quota (Wang, 2002).

[2] TCK disease is a fungal disease affecting wheat grown in several states of the USA.

In the near future, China's policy-makers would still regard grain self-sufficiency as the main target of agricultural production and international trade in grain as supplemental. This goal has been based on political reasons rather than economic ones. China's leaders still do not feel secure in the international community following the end of the Cold War. Some Western countries' attitudes, especially that of the United States about China's domestic problems, have been hostile. China's leaders have thought that relying on international markets as China's main source of grain consumption would decrease national security and political independence. On the other hand, due to the excess of labour supply in China, the secondary and tertiary industries could not absorb so many labourers from primary industries in such a short time. Developing grain production thus may arise as a last resort to absorb or maintain these labourers.

Since 1978, China's grain production has increased substantially to the extent that the country can basically now feed itself. The institutional changes, pricing policies, new technologies and more investment have contributed to this. With the population continually growing and arable land declining, additional regional specialization according to regional comparative advantage in grain production should become a more important source of production growth than it has been in the past. In this environment, the PGRS, whose target was to achieve grain self-sufficiency at the provincial level, should be studied in more detail.

The next section reviews the results of other research in which it is noted that there is regional variation in comparative advantage in grain production. The section after that will review the PGRS and provide some empirical evidence to test the hypothesis that the PGRS has had a strong impact in grain-sown areas. The fourth section provides a provincial model for the study of grain production in China and evaluates the impact of the PGRS. In the fifth

and last section, some concluding remarks about the PGRS and policy suggestions for further PGRS reform are presented.

5.2. Regional Comparative Advantage in China's Grain Production

Politically, China is divided into six regions: (1) The Northeast (N.E.) region of Heilongjiang, Liaoning and Jinin provinces; (2) The North (N.) region with the cities of Beijing and Tianjin; Hebei and Shanxi provinces and Nei Monggol autonomous region; (3) The Northwest (N.W.) region of Shaanxi, Gansu, and Qinghai provinces; and Ningxia Hui and Xinjiang Uygur autonomous regions; (4) The Central and South (C.S.) region of Henan, Hubei, Hunan, Guangdong, Hainan provinces, and Guangxi autonomous region; (5) The East (E.) region consisting of the city of Shanghai and the provinces of Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, and Shandong; and (6) The Southwest (S.W.) region consisting of the city of Chongqing, and the provinces of Sichuan, Guizhou, and Yunnan, and Tibet autonomous region. After the establishment of the PRC, this political division was used by the Communist Party to manage the whole of China. Between the layers of central government and provincial government there was regional government. In order to avoid the historical danger of separatist regimes re-emerging, the six regional governments were abolished in the early 1950s.[3]

Taking into account the consistency of data, the agricultural geographical features and the current social and cultural conditions, Fan (1990) divided China into seven regions for analytical purposes. The seven regions were: (1) the Northeast (N.E.), including Heilongjiang, Liaoning and Jinin; (2) the North (N.), consisting of the cities of Beijing, Tianjin, Hebei, Henan, Shandong, Shanxi, Shaanxi and Gansu; (3) the Northwest or Border region (N.W.),

[3] In fact, since the later period of the Qing Dynasty (A.D. 1644-1911), the central government in China was nominal. The central government that was controlled by the Beiyang Warlords (A.D. 1912-1926, with Beijing as its capital) and the Nationalist Party was also nominal. For example, the Nationalist Party government, established at Nanjing in 1927, effectively only controlled Shanghai and Jiangsu and Zhejiang provinces.

comprising Nei Monggol, Ningxia, Xinjiang, Tibet and Qinghai; (4) the Central region (C.), made up of Jiangxi, Hunan and Hubei; (5) the Southeast region (S.E.), including the heavily populated Shanghai, Jiangsu, Zhejiang and Anhui; (6) the Southwest region (S.W.), comprising Chongqing, Sichuan, Guizhou and Yunan; and (7) the South region (S.), embracing Guangdong, Hainan, Fujian and Guangxi.

According to the major grain crops, Carter and Zhong (1990) divided China into six regions: Pastoral, Spring Wheat, Winter Wheat, Wheat Rice, Double Rice and Southeast Rice. The six regions are: (1) The Pastoral region, including Nei Monggol, Ningxia, Xinjiang, Tibet, Qinghai and Gansu; (2) The Spring Wheat region, with Heilongjiang, Jilin and Liaoning; (3) The Winter Wheat region, comprising Beijing, Tianjin, Shandong, Shanxi, Hebei, Henan and Shaanxi; (4) The Wheat Rice region, which includes Hubei, Anhui and Jiangsu; (5) The Double Rice region, including Jiangxi, Hunan, Zhejiang, Guangdong, Guangxi, Fujian and Shanghai; and (6) The Southwest Rice region, comprising Sichuan, Guizhou and Yunan.

A region's comparative advantage and therefore likely trade position in an open market would be determined by its natural resources. Lu Feng (1996a,b) highlighted the heterogeneity of food products in terms of their factor intensity Referring to the debate on China's reliance on world markets to feed itself, and the work of Brown (1995), Lu argued that the answer to the question of who would feed China was that China would do so by itself through intra-regional grain trading. Fan (1990) indicated that China's regions showed great differences in regard to the distribution of natural resources and economic conditions. These endowments and economic differences, consequently, were reflected in total production and partial or total factor productivity growth patterns. The land/labour ratio had worsened, owing to the land endowment and population growth characteristics, which had determined the productivity

growth patterns and the agricultural technology employed. However, there were significant differences in the patterns and use of technology throughout China's regions.

Carter and Zhong (1989, 1991b) investigated the comparative advantages in China's agriculture by using five provinces to compare yield and return ratios between grain and cotton. They tested whether the pattern of sown areas (in the current year) varied according to expectations based on the indicators of comparative advantage which included land productivity ratios (in the previous period). They found that variation in regional specialization responded to comparative advantage in the first part of the reform period. But after 1984 when farmers had less say in production decisions there was a marked departure from this type of response. A similar method of testing the impact of comparative advantage was used by Park, Rozelle and Cai (1994) whose conclusions were similar to those of Carter and Zhong.

As discussed in Chapter 2, since the economic reforms and opening up of China to the world in the late 1970s, agricultural production has increased significantly, thanks to the establishment of the Household Responsibility System and rising grain purchase prices. Due partly to the central government's determination to ensure grain procurement and due partly to budget constraints on subsidies for procurement of grain quota, the strategy of developing commercial grain base areas that took into account the regional comparative advantage in grain production was adopted in the early 1980s. Commercial grain base areas have been defined as agricultural regions where natural conditions favour grain production and where the capacity to produce marketable grain is high. Through capital investment and infrastructure construction, commercial grain bases can provide a stable and large quantity of marketable grain (Liu, 1990).

Four criteria were established by the central government to determine whether a county was eligible for commercial grain base status. The county should: (1) have a comparative advantage in grain production, a large output and the potential to increase this even more; (2) have a high rate of marketable surplus of grain; (3) have convenient transportation and relatively good storage facilities; and (4) demonstrate a positive local government attitude, along with the ability to provide funds and other support (MoA, 1990).

A central feature of the establishment of commercial grain base areas was the method of accumulating investment funds. As described in Chapter 2, building the agricultural infrastructure was mainly the central government's responsibility, and the bulk of investment also came from it. The introduction of commercial grain base areas, however, determined the principle that the responsibility should be shared among different parties involved. Local governments, such as those operating in townships or villages, were required to contribute a combined amount equal to the central government's investment. This policy was designed to reduce pressure on the central government's budget.

In 1983, sixty counties were initially selected for the experiment in becoming commercial grain base areas. By 1985, the realized investment ratio of central to local investment was 1 to 1.36, with the central government investing 250 million RMB *yuan* and all sixty counties investing a total of 340 million RMB *yuan* (MoA, 1990). The investment returns in these commercial grain bases were relatively high. Between 1983 and 1985, the total amount of grain sold to the state (including the quota and above-quota sales) in these sixty commercial grain base counties (less than 3% of total number of counties) was 3.5 million tons, accounting for 13% of total grain purchases by the state during this time period (MoA, 1990). This success encouraged the central government to develop more commercial grain base areas. During the Seventh Five-Year Plan (1986-1990), about 400 counties were added to this

list. Since then more than 500 commercial grain base counties have been established by the central government (SSB, China's Rural Statistical Yearbook, 1994).

According to Yang (1999), there are 521 commercial grain base counties throughout China, and the majority of these counties are concentrated in the plains in China's eastern part. These areas have the advantage of suitable natural conditions, in particular a relatively ideal combination of sunlight, temperature, soil and water, for cultivating grains such as rice, wheat, corn and soybean. These plains include Sanjiang Plain, Songnen Plain, Huanghuaigai Plain, Tai Lake Plain, Boyang Lake Plain, Jianghan Plain, Dongting Lake Plain, Chengdu Plain and Pearl River Delta Plain.

The establishment of commercial grain base areas ran parallel with the regional comparative advantage. But, in the development of commercial grain areas, the interests of the central government, local governments and farmers differed, which would lead to obstructing the implementation of this policy. For the central government, the main focus of this policy was to ensure its grain procurement while reducing the investment in agriculture. However, for local governments, getting state funds to temporarily ease their financial difficulties may be the main incentive to becoming a commercial grain base area. As for farmers, they produce grain mainly because there were few employment opportunities outside the grain sector, even though the direct benefits of belonging to a commercial grain base area were rather modest. In general, although the policy of developing commercial grain base areas coincided with the regional comparative advantage, due to the scarcity of arable land, the small scale production determined by the Household Responsibility System, and the conflicting economic interests, the economic gains of this policy have been limited and the popular appeal of this strategy is very much doubted.

5.3. Provincial Governor Responsibility System

Before 1978 the Communist Party was in charge of solving the problem of regional production and grain supplies. Each province was required to produce sufficient grain supplies to meet local needs before they could produce other agricultural goods.[4] At that time, the political slogan was that grain provided the key to agricultural production (*Yi Niang Wei Gang!*). When the strategy of local self-sufficiency of grain was enforced, regional comparative advantage was given little consideration, and local agricultural resources were not used efficiently. As a result of this strategy, any intra-regional grain trade was minimal. Lardy (1990) has shown that during the 1970s, the intra-regional grain transfers accounted for only about 1 to 2 per cent of total production, compared to 5 per cent or even more in the 1950s.

In spite of the strong enforcement of the policy of local self-sufficiency in grain, for many years before the reform, China's grain output had seldom met its demand. In the meantime, the development of other agricultural production was retarded by the lack of resources. This policy was thus adopted at a higher economic cost for China as a whole, and was especially harmful in the areas with no comparative advantage in grain production.

After the reforms were introduced in 1978, the strategy of local grain self-sufficiency was gradually altered. Economic efficiency became the key concern in agricultural production. Each province was not required to achieve self-sufficiency in grain production. To some extent the new policy allowed the development of regional specialization in grain production through a market-determined resource allocation. Meanwhile, the central government adopted

[4] During Chairman Mao's rule some economic reforms were undertaken. The main characteristic of these reforms was the division of powers between the central and provincial governments. In other words, they were designed to increase the autonomous powers of provincial governments regarding economic production. The basis of these policies was that the provinces had different economic systems and traditions. Unfortunately, these reforms were not successful due to the cycle of chaos and repression in China (see Chapter 2).

some special policies to encourage this new move. As described in section 2 of this chapter, the establishment of commercial grain production bases constituted one of these new measures (Yang, 1999). In 1983, the central government began to allocate some special funds to develop grain production in some areas where natural conditions were favourable and the potential output considered high. In return, these areas were required to provide an extra amount of grain for state procurement. In addition to these areas, some provinces established local commercial bases for grain production (Yang, 1999).

Despite the fact that China's reforms since 1978 have brought about unprecedented success in agricultural production, the scarcity of arable land in contrast to the huge and still growing population remains a significant constraint for future grain production. During the reform period the area of arable land decreased rapidly owing to urbanization and industrialization. At the same time, with the development of other sectors in the rural economy, the costs of grain production rose quickly. In many areas, especially the coastal provinces, farmers became reluctant to produce grain and resources tended to be transferred to more profitable sectors, such as growing vegetables, flowers and fruit that can be supplied to cities at higher prices. These factors impeded grain production. On the other hand, demand has moved in the opposite direction. The growth of incomes spurred the increasing demand for grain and grain-related products, imposing heavier pressure on China's limited arable land. Since the late 1980s, grain production has slowed down and the conflict between the supply and demand of grain intensified. The central government adopted many policies, including subsidies to producers, requirements to meet the target of minimum sown areas and the increase in grain purchasing prices, to encourage grain production and promote the levels of grain self-sufficiency.

To respond to the grain market crisis in 1994 (see Chapter 2), a new system, namely the Provincial Governor Responsibility System (PGRS), was introduced. Under this new policy, each provincial governor was required to be responsible for the grain production and supply in his area of jurisdiction. Shortly after its implementation, it was reported that the PGRS encouraged grain production in coastal provinces, where grain output had plunged during the preceding years (Wang, 1996; Huang, 1996). Some, however, criticized the system, arguing that it set up barriers to market integration and therefore impeded regional specialization along the lines of comparative advantage (Cui, 1995; Cheng et al., 1996).

The new system provided an easy measure for policy-makers to require farmers to increase grain sown areas compulsorily. In some areas, mandatory production plans were restored and disseminated from provincial government to cities, counties and village cadres and finally to individual households. Although the grain purchasing price had increased by 46.63% in 1994, the grain sown areas declined further by 1.965 million ha (SSB, 1995). As shown in Table 5.2, the grain sown areas in 18 out of 30 provinces decreased in 1994. After the implementation of PGRS, in 23 out of 30 provinces the grain sown area in 1995 increased, and at the national level, the grain sown area rose by 1.516 million ha that year, but still could not compensate for the previous amount of reduction (SSB, 1996).

Table 5.2: Development of China's Grain Sown Area at the Provincial Level in 1994, 1995 and 2000

	1994	1995	2000
Beijing	-	+	-
Tianjin	-	+	-
Heibei	-	+	-
Shanxi	-	-	-
Neimonggu	+	+	-
Liaoning	-	+	-
Jilin	+	+	+
Heilongjiang	-	+	-
Shanghai	-	-	-
Jiangsu	-	+	-
Zhejiang	-	+	-
Anhui	+	+	+
Fujian	+	-	-
Jiangxi	+	+	-
Shangdong	-	+	-
Henan	-	-	-
Hubei	-	-	-
Hunan	+	+	-
Guangdong	+	+	-
Guangxi	+	+	-
Hainan	-	+	-
Sichuan	-	+	-
Guizhou	+	+	-
Yunnan	-	+	+
Tibet	-	+	+
Shaanxi	+	-	-
Gansu	+	+	-
Qinghai	-	-	-
Ningxia	+	+	-
Tibet	-	+	-

Source: Statistical Yearbook of China, various issues

The goal of China's reforms was to establish a market-oriented economy, but in the process of these reforms, some compulsory measures were often employed by the policy-makers to realize them. These administrative measures were sometimes used instead of market forces partly because the market infrastructure was not complete in China and partly because policy-makers had limited knowledge about market-oriented economics. As discussed in Chapter 2, since 1984, the main task of agricultural reform was to improve the grain marketing system,

but most of the trials were unsuccessful. The grain market infrastructure thus was not complete and could not guide farmers' production. Therefore, the lag in the grain marketing system reforms led to a failure of market forces. Under these conditions, China's policy-makers had to use traditional administrative measures to ensure or increase grain production in order to alleviate the market fluctuation. Without a doubt, the adoption of the PGRS was a backward measure and was not in line with the reform goal of a market-oriented economy and the exertion of regional comparative advantage in grain production. Although the PGRS could temporarily increase the output of grain through administrative measures, in the long run this policy threatened to distort the market mechanism, and reduce farmers' incentives to produce grain.

Since the adoption of the PGRS, there has been much debate regarding its impact on grain production. Those who favoured the system argued that it would be necessary to implement this system (Diao, 1995; Wang, 1996). Their argument was based on the following considerations:

(1). China is a large country and regional variation and comparative advantage exist among the provinces. A single, nationwide policy cannot meet the needs and realities of every region. The PGRS manages grain production at the provincial level. This system allows the individual province to formulate individual policies suitable for its own conditions.

(2). The PGRS urges grain deficit provinces to take measures to increase their grain supply. This thereby helps to solve the conflict between importing and exporting provinces over interregional transfers. Cui (1995) has argued that under the PGRS, the state grain system intends to handle only 50 million tons of grain through state procurement, and the other 40 million tons, formerly purchased by state grain enterprises, could be left to the market. Thus, the PGRS can be considered as the first step in the process of market integration.

Critics (Cheng et al., 1996) argued that the PGRS contradicted the development of regional specialization along the lines of comparative advantage. Since each province was asked to increase its own grain supply, provinces may have to sacrifice their comparative advantage. This may halt the development of other more efficient and profitable sectors. The debate focused on the approach that China should take to meet the increasing demand for grain. China's policy-makers felt insecure about relying on the international market to feed its people (Yang, 1995). Given this consideration and the incomplete grain marketing system, the PGRS appeared as a predictable administrative response to the problems of how to feed China.

5.4. China's Grain Production: the Provincial Models

As shown in section two, there was a regional comparative advantage in China's grain production. In this section, the models based on provincial data would be used to test the impact of the PGRS on grain production, and to provide a relatively accurate estimation of its impact on the output of grain.

5.4.1. Data and Methodology

5.4.1.1. Data

All the data in this study comes from various issues of *China's Statistical Yearbook.* For data consistency, the period chosen was 1989-2000. In 1988, Hainan province, which once was a part of Guangdong province, was established. Thus, in this study Guangdong and Hainan will be considered separately due to their different climates. (Most areas in Guangdong province are subtropical while Hainan is tropical). On the other hand, in 1997, Chongqing city, which was part of Sichuan province, was also established. For the purposes of this study, Chongqing will still be regarded as part of Sichuan province in 1997, 1998, 1999 and 2000 because the climatic conditions in Chongqing and Sichuan were almost the same.

5.4.1.2 The Model of Carter and Zhong

Carter and Zhong (1990) divided total grain output into two components: area and yield. In China, agricultural policies had a strong impact on grain production, so it was desirable to incorporate policy instruments in this type of model. Policy instruments should be included in an analysis of the factors underlying patterns of change in grain sown area and yield, and used to make a projection of China's grain production. On the other hand, the determinants of the regional variation in production should be also taken into account.

Policies concerning population control, grain purchasing prices and the price ratio of grain to cash crops were very important factors which could influence the grain sown area and yield. In addition, better inputs (higher qualities of seeds, fertilizers, etc.) and better cropping patterns may be developed as the result of technological progress. One way to consider technological advance was by taking time as its proxy, and this approach was used by Carter and Zhong. Thus, Carter and Zhong's model consisted of the following three equations:

(1). $A = f(Pop, Pg, Pr)$

(2). $Y = f(Pg, Pr, t)$

(3). $Q = A * Y$

where:

A= grain sown area;

Pop= population;

Pg= grain purchasing prices;

Pr= price ratio of grain to cash crops;

Y= grain yield;

t= time trend; and

Q= grain output

Price changes had certainly influenced the determination of the grain sown area since 1979. However, before 1979, the sown area was subject to quantitative control. The period 1979 to 1984 was too short to estimate an econometric model with three exogenous variables. Carter and Zhong simplified equation (1) into equation (4) below with one exogenous variable to avoid the problem of multicollinearity as three variables in equation (1), and maximized the degrees of freedom to obtain maximum significance in hypothesis tests:

(4). $A=a_0+a_1Pop+e$

Population was chosen as the independent variable because the amount of arable land was fixed, and the rate of decline in area in farm land partly depended on the success of the control on population growth. In order to avoid the problem of multicollinearity, the price ratio of grain to cash crops was also excluded as a factor in equation (2) which became:

(5). $Y=b_0+b_1Pg+b_2t+e$

where:

Pg = grain purchasing price index; and

t = a time trend which equals to 1,2,3.....

Covering 9.6 million square kilometres, China's climate varies enormously across a wide spectrum. A regional model might be more accurate than an aggregate model in reflecting important factors such as climate, resource endowment and the level of development influencing patterns of grain cultivation. For the purpose of this study the country was divided into six regions according to major grain crops. Data had been collected for each region and each region was modelled separately and then the results were aggregated.

In modelling regional production, it was even more difficult to apply theoretically appropriate models. Population data at the provincial level has been available only since 1981, so equation (4) could not be applied in the regional model as the period was too short in their studies to derive statistically significant estimates. Due to the immobility of China's population at that time, Carter and Zhong used the population growth index as the exogenous variable, which is roughly the same among regions. Equation (4) was modified as follows:

(6). $A_i=C_{oi}+C_{1i}Popind+e_i$

where:

A_i = grain sown area in region i (million ha);

Popind = national population growth index with 1979=100

Because of the data constraint, equation (5) must also be modified. Thus, the grain purchasing price index would be the only variable used in the modified model in order to avoid the problems of multicollinearity and maximize the degrees of freedom. Further, a pooled time-series and cross-sectional model would be used.

(7). $Y= d_0+ \sum_{j=2}^{m} d_j D_j +d_1Pg+e$

where the D_j terms were dummy variables, equal to one for jth province and zero for other provinces (m is the number of provinces in the region). This equation gave each province in any particular region the same regression coefficient but a different intercept.

Production was the product of estimated area and yield. Carter and Zhong estimated grain sown area at the regional level and yields in the provincial level. To estimate regional grain production, the estimated yield should be converted to the regional level. This is done by assigning a weight to the yield of each province. The formula was as follows:

$$\text{Weighted Yield} = \frac{\sum A_i \hat{Y}_i}{\sum A_i}$$

where A_i was the actual area of "ith" province and the $\hat{Y}_i$ estimated yield in that province.

5.4.1.3. Modified Model

In this study, due to the available data, the regional models of Carter and Zhong would be employed and modified. Carter and Zhong divided China into six regions: Pastoral, Spring Wheat, Winter Wheat, Wheat Rice, Double Rice and Southwest Rice. Each region was characterized by major grain types, climates, yield, and multi-cropping indices. Sometimes the differences within the regions can be great. For example, the wheat rice region includes Hubei, Jiangsu and Anhui provinces. But the northern parts of these three provinces lay in the winter wheat region and the southern part in the double rice region. Because of the data restrictions, these three provinces must be considered as a unified region. Data in the provincial level from *Statistical Yearbook of China* was used, so each province would be modelled separately and then the results would be aggregated. Equations (4) and (7) were used to estimate the grain sown area and grain yield at the provincial level.

Equations (4) and (7) were converted as follows:

(8). $A_i=a_0+a_1Pop_i+a_2P+e$

where:

A_i = grain sown area in province i (million ha);

Pop = population in province i (million person); and

P= dummy variable for the impact of the PGRS on grain sown areas. (Considering the time lag from 1989—1994 the dummy variable was 0, and in the rest of the time period, it was 1.)

(9). $Y_i = d_0+d_1Pg+d_2t+e$

Y_i = grain yield in province i (ton/ha);

Pg = grain purchasing price index (1989=100); and

The total grain production was:

(10). $Q = \sum A_i Y_i$

For comparison, the same model would be used at the national level.

5.4.2. Results

5.4.2.1. Results of the Model with P as the Dummy Variable to Test the Impact of the PGRS

Table 5.3: Regression Coefficients of the Provincial Area Model Using PGRS as the Dummy Variable

	a0	a1	A2	R	F	DW
Beijing	1.32	-0.08	0.08	0.92	51.38	1.43
	(10.94)	(-7.07)	(3.49)			
Tianjin	1.16	-0.08	0.02	0.54	5.23	1.04
	(4.54)	(-2.78)	(1.03)			
Heibei	5.77	0.02	0.21	0.49	4.29	2.20
	(2.61)	(0.47)	(1.39)			
Shanxi	3.48	-0.01	-0.02	0.16	0.85	2.56
	(5.48)	(-0.37)	(-0.41)			
Nei	-3.22	0.32	0.30	0.78	16.08	1.21
Monggul	(-0.82)	(1.82)	(1.04)			
Liaoning	5.70	-0.07	0.05	0.54	5.22	1.86
	(5.58)	(-2.58)	(1.03)			
Jilin	0.86	0.11	-0.05	0.61	7.02	1.89
	(0.89)	(2.78)	(-0.72)			
Heilongjiang	-0.88	0.23	0.13	0.82	20.73	1.07
	(-0.29)	(2.72)	(0.84)			
Shanghai	0.93	-0.04	0.003	0.82	20.67	0.83
	(7.52)	(-4.35)	(0.19)			
Jiangsu	15.58	-0.14	0.11	0.83	21.58	1.22
	(7.77)	(-4.70)	(0.80)			
Zhejiang	11.17	-0.19	0.08	0.80	18.34	0.74
	(5.79)	(-4.19)	(0.59)			
Anhui	10.09	-0.07	0.22	0.45	3.75	2.00
	(6.76)	(-2.73)	(2.03)			
Fujian	3.52	-0.05	0.06	0.52	4.94	1.47
	(6.33)	(-2.66)	(1.17)			
Jiangxi	7.04	-0.09	0.20	0.45	3.72	2.23
	(5.23)	(-2.61)	(1.79)			
Shangdong	14.30	-0.07	0.16	0.27	1.66	1.55
	(4.01)	(-1.75)	(0.90)			
Henan	12.92	-0.04	0.16	0.33	2.26	1.58
	(6.62)	(-1.99)	(1.12)			
Hubei	12.67	0.14	0.17	0.72	11.51	1.33
	(5.60)	(-3.38)	(0.95)			
Hunan	9.84	-0.07	0.05	0.63	7.66	1.61
	(5.92)	(-2.77)	(0.63)			
Guangdong	5.08	-0.02	-0.06	0.46	3.94	0.77
	(6.36)	(-1.74)	(-0.37)			
Guangxi	3.22	0.01	0.10	0.71	10.90	1.56
	(5.31)	(0.59)	(2.24)			
Hainan	0.53	0.01	-0.01	0.03	0.15	1.36
	(3.56)	(0.25)	(-0.47)			

Continued:

Sichuan	3.71	0.06	-0.12	0.42	3.31	1.24
	(1.07)	(1.77)	(-0.67)			
Guizhou	-0.91	0.11	0.10	0.88	34.08	1.28
	(-0.90)	(3.49)	(1.09)			
Yunnan	-0.90	0.12	-0.10	0.75	13.84	0.50
	(-0.67)	(3.33)	(-0.75)			
Tibet	0.12	0.03	-0.02	0.59	6.48	0.69
	(3.56)	(2.16)	(-0.41)			
Shaanxi	4.13	-0.001	-0.16	0.51	4.60	2.91
	(3.23)	(-0.03)	(-1.70)			
Gansu	3.01	-0.01	0.04	0.15	0.78	1.69
	(6.16)	(-0.32)	(0.84)			
Qinghai	0.90	-0.11	0.02	0.55	5.60	1.06
	(4.51)	(-2.52)	(1.10)			
Ningxia	0.32	0.08	0.03	0.89	37.79	1.66
	(2.41)	(3.07)	(1.59)			
Xinjiang	3.28	-0.10	0.05	0.73	12.63	1.39
	(7.54)	(-3.56)	(0.72)			

Source: Calculated by the author; figures in parentheses are t-ratios

At first, a dummy variable (P) was used to test the impact of the PGRS on the grain sown area as shown in equation (8). As discussed in section three, under the PGRS the policy often employed by China's leaders was to plan the grain sown area, thus the PGRS would be put into effect. The results of the o.l.s. estimation were not good. Only in five provinces - Beijing, Anhui, Jiangxi, Shaanxi and Ningxia - were the coefficients of P statistically significant (see Table 5.3).

When this dummy variable was used for the estimation of sown areas at the national level, its coefficient was statistically significant. The results were as follows and in the parentheses were t-ratios (5% significant level and so after):

$$A=154.387 -0.0370Pop +3.398P$$

$$(5.57) \quad (-1.56) \quad (1.62)$$

$$R^2=0.23 \qquad F=1.35 \qquad DW=1.40$$

5.4.2.2. Results of Panel Data Methods

For a comparison, the panel data methods (Veerbeek, 2000) that had sufficient degrees of freedom to identify all the parameters in equations (8) and (9) were used to test the hypothesis. Through the random effect model (two-way random effect model), the data in the provincial level were calculated jointly. The results were as follows and the figures in parentheses below the equations indicate their t-ratios.

A= 2.981+0.019Pop-0.034P
(8.64) (3.17) (-0.88)
R^2=0.03

Y= 3.693-0.00000241Pg+0.069t
(18.39) (-0.08) (6.12)
R^2=0.09

The panel data results do not support the hypothesis. The grain sown areas had no direct relationship with the dummy variable of the PGRS. And at the same time, the yield also had no relationship with the grain purchasing price index. That the grain purchasing price index was at the national level and there were no differences among the provinces could explain the lack of direct relationship with the yield.

5.4.2.3. Results of the Model without Dummy Variable P

For an accurate estimation, this dummy variable (P) had to be deleted from equation (8) for estimating the sown area at the provincial level. Thus, equation (8) was converted into:

(9). $A_i=a_0+a_1Pop_i+e$

Table 5.4: China's Grain Sown Area, Population, Grain Purchasing Price Index and Grain Yield from 1989 to 2000

	Grain Sown Area (million ha)	Population (million)	Grain Purchasing Price Index (1988=100)	Yield (ton/ha)*
1989	112.205	1127.04	126.9	3.630
1990	113.466	1143.33	118.3	3.930
1991	112.314	1158.23	111.00	3.870
1992	110.560	1171.71	116.90	4.004
1993	110.509	1185.17	136.40	4.131
1994	108.544	1198.50	200.00	4.101
1995	110.060	1211.21	258.00	4.240
1996	112.548	1223.89	273.00	4.483
1997	112.912	1236.26	246.20	4.377
1998	113.787	1248.10	238.10	4.502
1999	113.161	1259.09	207.39	4.493
2000	108.463	1265.83	187.07	4.261

Source: SSB, Statistical Yearbook of China, various issues.
*Notes: * calculated by the author. In 1996 there was a survey about land use conducted by the Ministry of Land and Resources, State Statistics Bureau and National Agricultural Census Office of China. The arable land in China was underreported in the past. In 1995, China's Statistical Yearbook recorded 94.97 million ha, and in 1996 this changed to 130.04 million ha. The grain sown area probably had been underreported as well. In the Yearbook, however, the grain sown area had not changed significantly either. This means that yields had been over-reported. This discrepancy has existed since the mid-1950s, and thus the error may have been constant from year to year.*

The empirical results of the grain areas in the provincial and national levels from o.l.s. estimation using 1989-2000 data are indicated in Table 5.5 below. Figures in parentheses in tables are t-ratios.

Table 5.5: Regression Coefficients of Provincial Area Model

	a_0	a_1	R^2	F	DW
Nation	115.866	-0.0035	0.01	0.08	1.10
	(7.59)	(-0.28)			
Beijing	0.942	-0.042	0.81	42.69	1.42
	(12.13)	(-6.53)			
Tianjin	0.966	-0.057	0.48	9.37	1.15
	(5.59)	(-3.06)			
Heibei	3.381	0.056	0.38	6.08	1.80
	(2.34)	(2.47)			
Shanxi	3.693	-0.015	0.14	1.66	2.59
	(10.24)	(-1.29)			
Nei	-6.752	0.487	0.75	30.78	0.99
Monggol	(-3.40)	(5.55)			

Continued:

Liaoning	4.849	-0.044	0.48	9.35	1.69
	(8.21)	(-3.06)			
Jilin	1.400	0.084	0.59	14.21	1.93
	(2.43)	(3.77)			
Heilong-jiang	-3.041	0.291	0.81	41.95	0.83
	(-1.84)	(6.48)			
Shanghai	0.910	-0.039	0.82	45.71	0.83
	(11.24)	(-6.76)			
Jiangsu	14.345	-0.119	0.82	44.06	1.18
	(11.37)	(-6.64)			
Zhejiang	10.293	-0.170	0.80	38.88	0.80
	(8.69)	(-6.23)			
Anhui	7.732	-0.029	0.21	2.58	1.38
	(7.21)	(-1.61)			
Fujian	3.010	-0.031	0.45	8.22	1.36
	(8.70)	(-2.87)			
Jiangxi	5.024	-0.038	0.26	3.46	1.38
	(6.19)	(-1.86)			
Shandong	12.021	-0.046	0.20	2.57	1.49
	(4.84)	(-1.60)			
Henan	11.240	-0.025	0.24	3.19	1.20
	(8.96)	(-1.79)			
Hubei	10.902	-0.106	0.69	22.34	1.15
	(8.52)	(-4.73)			
Hunan	8.997	-0.060	0.61	15.88	1.48
	(9.37)	(-3.98)			
Guangdong	5.274	-0.025	0.46	8.48	0.78
	(9.03)	(-2.91)			
Guangxi	2.140	0.033	0.54	11.97	0.72
	(4.91)	(3.46)			
Hainan	0.594	-0.003	0.01	0.09	1.23
	(7.41)	(-0.30)			
Sichuan	5.735	0.037	0.39	6.53	1.27
	(3.49)	(2.56)			
Guizhou	-1.826	0.134	0.87	65.80	1.28
	(-3.18)	(8.11)			
Yunnan	-0.046	0.095	0.74	28.34	0.54
	(-0.06)	(5.32)			
Tibet	0.130	0.027	0.58	13.96	0.65
	(7.65)	(3.74)			
Shaanxi	5.886	-0.054	0.35	5.30	2.95
	(7.22)	(-2.30)			
Gansu	2.655	0.009	0.08	0.87	1.63
	(11.29)	(0.93)			
Qinghai	0.711	-0.068	0.49	9.79	0.84
	(6.80)	(-3.13)			

Continued:

Ningxia	0.142	0.122	0.86	63.28	1.55
	(1.82)	(7.95)			
Xinjiang	3.040	-0.083	0.72	26.01	1.45
	(11.22)	(-5.10)			

Source: Calculated by the author; figures in parentheses are t-ratios

These results for the grain sown area equations do not all support the hypothesis that population growth would lead to a reduction in grain sown areas. In Hainan, Shanxi and Gansu provinces, there was no relationship between population and grain sown area. In the 10 out of the 27 provinces left, the grain sown areas increased with population growth. These 10 provinces (for example, Heibei, Sichuan and Tibet) were all without exception underdeveloped regions, where urbanization and industrialization led only to a slow decrease in arable land. Due to the PGRS, every province was responsible for stabilizing or increasing the grain sown areas. So, in the short-term, administrative power could be used to increase the grain sown areas and at the same time, the population increased slightly due to population control measures. Whether the PGRS can increase the grain sown areas in the long-term should be studied further. As shown in Table 5.4, at the national level, during 1989-2000 the population grew by about 1.1% annually from 1127.04 million (1989) to 1265.83 million (2000).

The empirical results of grain yield equation (9) at the provincial and national levels from o.l.s. estimation using 1989-2000 data are shown in Table 5.6 below. Figures in parentheses in tables are t-ratios.

Table 5.6: Regression Coefficients of Provincial Yield Model

	d_0	d_1	d_2	R^2	F	DW
Nation	3.542	0.0017	0.047	0.86	27.41	1.95
	(31.61)	(2.11)	(3.42)			
Beijing	5.436	0.0043	-0.100	0.22	1.23	0.66
	(10.45)	(1.15)	(-1.57)			
Tianjin	3.700	0.0054	-0.058	0.38	2.77	0.85
	(11.70)	(2.34)	(-1.49)			
Heibei	2.732	0.0039	0.024	0.92	53.28	1.80
	(28.43)	(5.59)	(2.02)			
Shanxi	2.301	0.0039	-0.029	0.38	2.73	3.05
	(9.36)	(2.17)	(-0.96)			
Nei Monggol	2.005	0.0022	0.047	0.53	5.01	2.16
	(6.92)	(1.05)	(1.32)			
Liaoning	4.370	0.0001	0.064	0.09	0.44	1.79
	(5.32)	(0.02)	(0.63)			
Jilin	4.313	0.0061	0.010	0.20	1.16	2.18
	(5.05)	(0.99)	(0.10)			
Heilongjiang	2.283	0.0039	0.052	0.68	9.49	1.85
	(7.82)	(1.81)	(1.45)			
Shanghai	5.487	0.0003	0.075	0.79	16.69	1.60
	(34.43)	(0.25)	(3.84)			
Jiangsu	4.567	0.0024	0.076	0.88	32.43	2.87
	(28.88)	(2.12)	(3.88)			
Zhejiang	4.808	0.0006	0.025	0.59	6.42	2.35
	(45.00)	(0.72)	(1.92)			
Anhui	3.174	0.0043	0.022	0.54	5.36	2.73
	(9.55)	(1.80)	(0.61)			
Fujian	4.193	-0.00001	0.049	0.88	31.75	1.01
	(85.00)	(-1.01)	(7.53)			
Jiangxi	4.251	0.0007	0.040	0.66	8.69	2.53
	(30.75)	(0.39)	(2.36)			
Shandong	3.945	0.0016	0.090	0.71	11.08	1.64
	(14.26)	(0.81)	(2.64)			
Henan	3.146	0.0003	0.122	0.89	35.00	2.48
	(18.04)	(0.20)	(5.67)			
Hubei	4.313	0.0016	0.059	0.82	20.69	3.19
	(29.70)	(1.47)	(3.29)			
Continued:						
Hunan	4.809	0.0006	0.040	0.85	26.04	2.42
	(61.98)	(1.12)	(4.15)			
Guangdong	4.475	-0.0002	0.097	0.78	15.52	1.56
	(22.72)	(-0.15)	(3.98)			
Guangxi	3.674	-0.0005	0.058	0.55	5.57	2.65
	(19.95)	(-0.35)	(2.56)			

Continued:

Hainan	2.730	0.0008	0.077	0.90	39.18	2.51
	(23.73)	(0.93)	(5.45)			
Sichuan	4.187	-0.0003	0.041	0.61	7.17	1.08
	(36.17)	(-0.39)	(2.90)			
Guizhou	2.833	0.0002	0.068	0.82	20.07	3.08
	(21.81)	(0.19)	(4.27)			
Yunnan	2.710	0.0008	0.052	0.98	195.66	2.04
	(73.88)	(3.00)	(11.43)			
Tibet	2.689	-0.001	0.185	0.97	138.53	2.25
	(22.20)	(-1.17)	(12.38)			
Shaanxi	2.527	0.0004	0.040	0.21	1.23	2.66
	(9.70)	(-0.23)	(1.24)			
Gansu	2.204	0.0002	0.046	0.46	3.82	2.23
	(10.82)	(0.12)	(1.84)			
Qinghai	2.613	0.0027	-0.019	0.36	2.49	1.18
	(14.79)	(2.06)	(-0.84)			
Ningxia	2.277	0.0008	0.083	0.73	12.12	1.67
	(10.41)	(0.48)	(3.06)			
Xinjiang	3.118	0.001	0.175	0.99	302.09	1.90
	(35.18)	(1.51)	(15.97)			

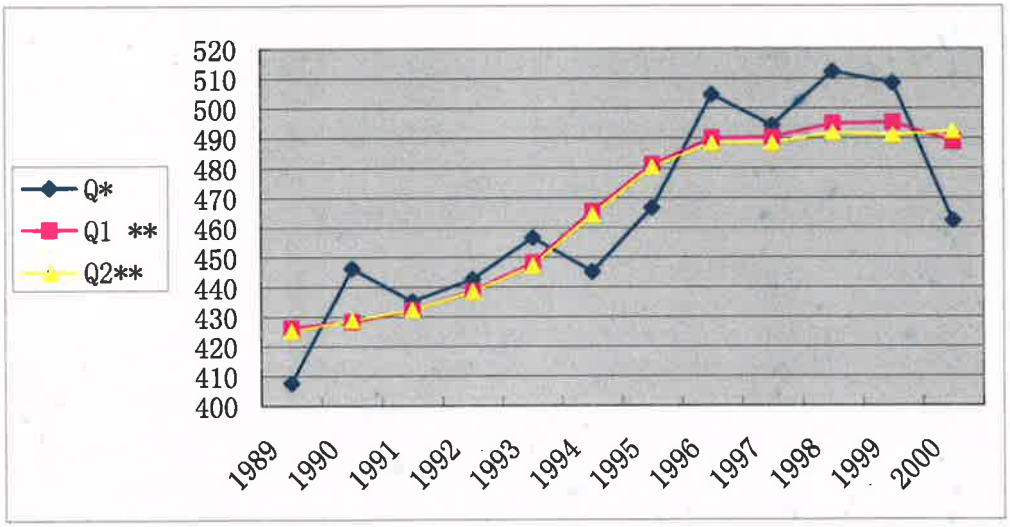
Source: Calculated by the author; figures in parentheses are t-ratios

At the national level, the model supported the hypothesis well. The yields would increase by 1.7 kilograms/ha with 1 per cent increase of grain purchasing price index, and 47 kilograms/ha with technological changes. The model did not support the hypothesis well at the provincial level. As a result of technological progress the yields will increase from 25 kilograms/ha (Zhejiang province) to 175 kilograms/ha (Xinjiang province) yearly. But these empirical results did not all support the hypothesis that the yield would increase along with the increase of the grain purchasing price index. In 22 out of 30 provinces, there was no direct relationship between yield and the grain purchasing price index. The other 8 provinces displayed a positive relationship between yield and grain purchasing price index. With a 1 per cent increase in the grain purchasing price index, the highest response was in Tianjin city (5.4 kilogram/ha) and the lowest in Yunan province (0.8 kilogram/ha). As seen in Table 5.4, at the national level the grain purchasing price index increased dramatically. In 1994 it increased by 46.6% and

decreased by 9.8% in 1997 and 2000. In contrast to the grain purchasing price index, the yield increased steadily by about 2.5% annually.

5.4.2.4. Projections of Grain Production

Figure 5.1: Comparison of Estimated and Actual Grain Production, 1989-2000 (million tons)



Notes:
** Q is the actual output of grain. Statistical Yearbook of China, various issues, SSB.*
***Q_1 is calculated by using the provincial models, and Q_2 using the same model at the national level.*

The estimated grain production was calculated and compared to actual production for the same period, which was shown in Figure 5.1 (for more details see Appendix A). The largest difference between actual and estimated production occurred in 2000; 26.81 and 30.25 million tonnes respectively by using the same model at national and provincial levels. Both of them were more than 5 per cent of the actual production. The result - based on adding the volumes from the models in the provincial level - was better than that of using the same model at the national level.

5.5. Conclusion

From 1996 to 1999 China experienced a good series of grain harvests. Some policy-makers believed this was due to implementing the PGRS.[5] Section four of this chapter, however, has shown that the PGRS was statistically insignificant regarding the grain sown areas in most provinces. Thus, the efficiency of the PGRS was doubtful and this needs further careful study. The supply of grain exceeded demand significantly due to the harvests in 1996 to 1999. The problems of storage and sale of grain were very serious at that time, although the problems of supply had been solved temporarily. Under these conditions, the PGRS was not implemented strictly and thus in 2000, the grain sown area only actually increased in Jilin, Anhui, Yunnan and Tibet (see Table 5.2.) with the grain purchasing price index declining by 9.8 per cent. This phenomenon could be interpreted partly by decreasing provincial governments' mandatory production plans, and partly by the response to grain price signals.

Since 1978, the rural economy in China has been reformed significantly but reforms in the grain procurement and marketing system have lagged. Without a complete mechanism, the farmers cannot plan and manage their agricultural production in response to price signals, although they could produce crops under the Household Responsibility System. In the future, if China does not want to rely on the world market for grain supplies and the grain market is still not market-oriented and often interrupted by government measures, should a grain production crisis arise the PGRS will still be used by policy-makers. However, if or when the grain market is complete and farmers can produce according to the price signals, the PGRS or some government intervention into farmers' production practices will disappear gradually. In

[5] When I worked in the MoA some departmental ministers and directors shared this opinion. Due to an incomplete market mechanism that had experienced some failures and the presence of a residual planned economy, some policy-makers would rather still rely on administrative measures, the visible hand, rather than the market forces, the invisible hand.

the next chapter, the reformation of the grain market since the late 1970s will be discussed for the purpose of understanding clearly the rationale and problems concerning the PGRS.

CHAPTER 6

CHINA'S GRAIN MARKETING SYSTEM REFORMS

As discussed in the previous chapters, since 1984 the main task of agricultural reform has been to improve the grain procurement and marketing system. However, many measures have been unsuccessful. Due to delays in the grain procurement and marketing system reform that led to the use of administrative measures in an incomplete market mechanism, farmers could not make decisions about grain production in response to price signals. In this chapter, China's grain marketing system reforms will be discussed.

This chapter is organized as follows. In the first section, in order to understand the policies adopted since 1978, the grain procurement and marketing system before the late 1970s will be described briefly.[1] In the second section, the major policies adopted between 1978 and 1997 to reform the grain procurement and marketing system will be reviewed. The main task of the third section is to evaluate the 1998 grain marketing system reform, using empirical evidence. The fourth section will describe briefly ongoing reforms in the grain marketing system from the end of 2000 to the present time.

6.1. The Grain Procurement and Marketing System in China before Agricultural Reform in 1978

6.1.1. The Grain Procurement System

China is a large country with a huge population but limited agricultural resources. The feudal land system lasted thousands of years with landless peasants often being cruelly exploited by

[1] The presentation and discussion in this section is mainly based on Zhou (1993) with his permission. I would like to express my gratitude to him.

their landlords.[2] China's farming methods were primitive and the yields were generally low. The Sino-Japanese war, the civil war during the 1930s and 1940s and the years of Japanese military occupation damaged the agricultural economy even further. Grain production declined sharply. It was only 113 million tons in 1949 compared with 150 million tons in 1936[3], marking a decrease of 26%. Grain output per capita was only 208 kilograms in 1949 and many people starved to death (MoA, 1989).

The civil war ended in 1949 and the Chinese Communist Party (CCP) was victorious, reuniting China and proclaiming the People's Republic of China on October 10, 1949. At that time, grain production was low and importing grain was difficult due to blockades by some Western countries.[4] Private grain traders dominated the market, leading to serious problems such as profiteering and hoarding. Grain prices fluctuated and soared, very often many times within a day. From April 1949 to February 1950, in the wake of grain price fluctuations, prices for other commodities rose and the markets were very unstable (Zhou, 1993).

Thus, stabilizing prices, especially grain prices, and improving grain production was the highest priority for the new government in order to feed the people and win their trust. Many measures were taken such as restoring and developing grain production, cracking down on hoarding and speculation, and organizing state grain supplies better. As a result, the situation was brought under control by the end of 1950. During 1951—1952, the national economic situation improved steadily and state grain organizations established leading positions in the grain market.

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[2] In China, the feudal land system appeared gradually in the eras known as Spring and Autumn (770 – 476 B.C.) and Warring States (475 – 221 B.C.). In 221 B.C. the first dynasty of centralized feudal monarchy - the Qin (221 – 206 B.C.) - was established. The First Opium War between the Qing Dynasty (1644 -1911) and Britain from 1840 to 1842 heralded the gradual collapse of China's semi-feudal society and traditions.

[3] The Sino-Japanese war broke out on July 7. 1937 at Marco Polo Bridge, which is close to Beijing.

[4] On October 27, 1950, the army of the PRC joined the Korean War (June 25, 1950 – July 27, 1953) and fought against the U.S.-led United Nations forces.

Although the grain situation had improved, the supply of grain was still inadequate. Early in 1952, Chen Yun, the Vice Premier of the Administrative Council (the Administrative Council was replaced in 1954 by the State Council) and Director of the State Committee for Finance and Economy, gave to the Central Committee of the CCP a report in which he put forward the policy that government grain procurement was necessary (Chen, 1952). The basic principles outlined in his report were incorporated into the planned grain procurement methods adopted in the following years.

After three years of economic recovery, China's central government put forward its first Five-Year Plan in 1953. Economic reconstruction and development were underway on a large scale. Industrialization and urbanization were the main goals for the new central government. From 1950, although grain production expanded fairly quickly, the demand for commercial grain increased even faster due to the Korean War. Industrialization and urbanization had led to the rapid increase of the urban population. In 1952, grain output exceeded the previous historical high record set in 1936 (MoA, 1989). At the same time, however, most of the increased output was consumed by peasants who constituted more than 80% of the total population and their standard of living and consumption of grain had improved significantly due to the land reform program during 1949—1952. On the other hand, the gap between the state purchase price and the price offered by private merchants was 20—30% (Carter and Zhong, 1989). Peasants were reluctant to sell grain to state grain agencies. Consequently, the proportion of grain obtained by the government decreased (Zhao and Qi, 1988).

To manage the worsening situation, the central government adopted several policies, i.e. to procure grain from rural areas and supply it to urban areas (Chen, 1953). On 16 October 1953, the Central Committee of the CCP issued a document entitled 'Resolution on the implementation of a planned purchase and a planned supply of grain' (MoA, 1989). On 23 November of that year the Administrative Council issued a document entitled 'Directive

regarding the implementation of a planned purchase and a planned supply of grain' (MoA, 1989). From the beginning of December 1953, the Resolution and Directive were implemented for the whole of China, except for Tibet. Under this policy, the state grain agencies became the sole buyers and sellers in the grain market. This grain marketing system was frequently referred to as the "unified grain purchase and sale system" in China.

The "unified grain purchase and sale system" had four major features: (1) planned grain purchase (often known as the "unified grain purchase"), (2) planned grain sale (known as the "unified grain sale"), (3) government control of the grain market, and (4) exclusive management of the grain economy by the central government. The centrally planned purchase of grain was the most important aspect of the successful implementation of this policy. The compulsory procurement quota and state-set procurement price were the two major instruments used to ensure the successful implementation of the planned grain purchase. Under this policy, a procurement quota was assigned to each individual household. The procurement price offered by the government was nearly the same as the price in the grain free market at that time and was acceptable to the peasants. To perfect the "unified grain purchase and sale system", a "three-fix (*san ding*)" policy was tried in early 1955 and endorsed officially by the State Council in late 1955. The "three-fix" referred to the official fixing of the grain output (*ding chan*), the procurement quota (*ding gou*), and the quantity supplied on resale to households with a deficit in grain (*ding xiao*).

As the agricultural cooperative movement proceeded, individual household farming was gradually replaced by cooperative farming. Many modifications were undertaken in October 1956 by the State Council based on a document entitled 'Regulation on the unified grain purchase and sale applying to agricultural cooperatives' (Zhou, 1993). The main modifications were: (1) the "three-fix" method was still implemented, but on a cooperative basis; (2) the amount of grain supplied to the agricultural population in disaster-affected and

low production-level areas, and to cooperatives and households (which had not joined the cooperatives) with a deficit in grain was slightly reduced, and (3) the government should procure a proportion of the increased output from these cooperatives and households. Grain so purchased was named as "above-quota purchase (*chao gou*)". The price used by the government for such grain was the same as that for the fixed-quota purchased grain.

In 1958, Chairman Mao Zedong launched the Great Leap Forward and the people's commune movements that severely damaged the national economy, especially in agriculture. Grain production slumped dramatically in 1959 despite good weather, and declined even further in 1960 (SSB, 2001). As a result, an infamous and man-made famine took place, in which millions of people died from hunger (Ashton, Hill, Piazza and Zeittz, 1984).

During 1960—1966, many policy measures were enacted in order to improve grain production: (1) the procurement price was increased three times during this period, and as a consequence it was 35% higher in 1965 than that in 1957, (2) a premium on the procurement price was introduced to encourage farmers to produce more grain and sell more to the state grain agencies, (3) some industrial goods were provided as incentives to farmers who sold more grain to the state, and (4) the free grain market which had been banned in 1957 was reopened. The government also introduced "negotiated purchase (*yi gou*)" in order to acquire as much grain as possible, and (5) the "three-fix" policy was reintroduced in 1965. With the implementation of these incentives, by 1966 the national grain output surpassed its previous highest level of 1958 (see Table 6.1).

As soon as the pressure on grain supply eased, the Cultural Revolution of 1966 took place and lasted for ten years with serious consequences for economic development. During these ten years, grain production stagnated for the first four years and increased only slightly during the remaining six years (see Table 6.1).

Table 6.1: Grain Production in China during 1949—1977

Year	Grain Output (million tons)
1949	113
1950	132
1951	144
1952	164
1953	167
1954	169
1955	184
1956	193
1957	195
1958	200
1959	170
1960	143
1961	147
1962	160
1963	170
1964	188
1965	195
1966	214
1967	218
1968	209
1969	211
1970	240
1971	250
1972	240
1973	265
1974	275
1975	284
1976	286
1977	283

Annual Average Growth Rate (%):
1949—1957: 7.04
1958—1965: -0.39
1966—1977: 2.99
Source: MoA, 1989; China's Rural Economic Statistical Encyclopedia 1949—1986.

During the Cultural Revolution, the "three-fix" policy was still used and contributed to the slow increase in grain output. This policy should have been renewed in 1967. However, people everywhere were too busy with "being revolutionaries" and the entire country was in turmoil. It was impossible to review the three-fix policy, which had been extended for another three years (1968-1970). In 1971, it was extended to five years and documented in 'Circulation on the implementation of fixed grain procurement quota for five years by the Central Committee of the CCP' (CCP, 1971). This edict also decided that an "above-quota price" was to be offered to farmers if they sold above-quota grain to state grain agencies. The

above-quota price was the unified procurement price plus a price premium of up to 30%. Meanwhile, the "negotiated price" was also used to obtain grain in order to meet the commitment to the rationed production. However, after an increase in 1966, the procurement price remained unchanged for 12 years (1967-1978) (Zhou, 1993). On the other hand, grain production costs increased, in some areas substantially, thus discouraging farmers from growing more grain.

6.1.2. The Grain Rationing System

When there is a food shortage in a country, the success of a government's food policy will depend more on the efficiency of food distribution. When a government intervenes in the grain market and takes direct responsibility to feed its people, direct control over grain distribution is necessary. After the establishment of the People's Republic of China, in order to ensure that people received a fair amount of grain, a rationing system was introduced at the end of 1953, almost at the same time as the unified grain procurement system was implemented. Broadly, the rationing system covered three kinds of consumers: (1) the non-agricultural population who were issued with food coupons. The ration was determined by the government according to age and occupation; (2) the agricultural population who engaged in non-grain businesses or those who produced grain that was insufficient for their own consumption. The total quantity supplied to the rural areas was controlled by the government; and (3) industrial users (e.g., food-processing factories) whose amount was determined by the average quantity used over a certain period and controlled by the government.

The use of food coupons was a basic element of the rationing system. They could be used in government grain stores, restaurants and manufactured food stores. Usually, they could only be used within the issuing areas (e.g., a city or a province) but a local food coupon could be exchanged for a more general one, i.e. issued by a higher level government to facilitate travelling outside of the local area. The local food coupons were usually issued monthly. In

some areas, they could be used any time once issued while in others they were valid only for a specific time period. In some areas, mainly in the north of China, the proportion of fine grains and coarse grains that could be bought with the local food coupon was fixed by the local government. The system had undergone few significant changes since its implementation, with only minor alternations in the supply standards and prices and some changes in the provision to the agricultural population.

After the Great Leap Forward, grain production declined for several years and grain shortages resulted. In September 1960, per capita rations of non-agricultural population were reduced by one kilogram per month (MoA, 1989). At the same time, strict controls over grain supplied to the agricultural population and other grain users were implemented. Another measure was to reduce the non-agricultural population by 20 million between 1961—1963 by moving people out of cities to rural areas (Zhou, 1993).

During 1958—1961, the grain procurement price was raised three times but the prices at which the government sold grain to consumers did not alter. As a consequence, after 1961 the grain sale price was lower than the procurement price. To solve this problem the sale price was changed accordingly. Firstly, in 1963 the sale price of grain to the agricultural population and other grain users was raised to the same level as the government paid for the grain. Secondly, in 1965 the sale price of grain to the non-agricultural population was raised to equal the procurement price. In 1966, the grain sale price was raised simultaneously with an increase in the procurement price. From 1966 to 1977, there were no procurement price adjustments for major grain crops. A grain subsidy was adopted in China in 1961 and it has been increasing steadily since then (see Table 6.2). Before the reforms of 1978, the grain subsidy was not a huge burden for the central government, except in 1962 when it reached 9.21% of the total budget.

Because the goal of China's economic development was industrialization and urbanization, the primary role of the rural sector was to provide grain to support the increasing urban population and to provide some resources for industrial production. When agriculture dominated the economy before the reform, the rural sector was also the major source of investment funds. Capital accumulation was crucial to China's industrialization and economic development. However, the marginal propensity to consume is relatively high in a low-income country. Therefore, measures were taken by the central government to restrict consumption and to accumulate funds for industrial investment. In this situation the grain marketing system before reform had three interrelated objectives: (1) to continuously stimulate grain production, (2) to distribute grain efficiently, and (3) to extract funds for economic development.

Table 6.2: Total Annual Subsidy on Grain Consumption in China during 1950-1977

Year	Grain Subsidy * (RMB *yuan*, Billion)	Grain Subsidy in Total National Budget (%)
1950—1960	0.00	0.00
1961	1.91	5.36
1962	2.89	9.21
1963	2.38	6.96
1964	2.40	6.01
1965	2.05	4.33
1966	2.10	3.75
1967	2.38	5.68
1968	2.49	6.89
1969	2.72	5.16
1970	3.04	4.59
1971	2.44	3.28
1972	2.97	3.87
1973	2.95	6.34
1974	3.30	4.21
1975	4.18	5.13
1976	4.99	6.46
1977	4.94	5.65

*Notes: * The subsidy includes the subsidy for edible oil.*
Source: Carter and Zhong (1989).

The marketing system ensured a cheap grain supply to the industrial sector. As a result of this a surplus in the rural sector appeared as industrial profits were collected from state-owned enterprises. The central government, in turn, used these profits for further investment.

To summarize: before the economic reforms of 1978, the central government planned the national economy. The main characteristic of the grain procurement and marketing system was that most aspects of the system were controlled and managed by the Chinese Communist Party.

6.2. Overview of China's Grain Procurement and Marketing System Reforms from 1978 to 1997

From the late 1970s onward there have been many economic reforms in China, and the grain procurement and marketing system is symbolic of this. The first reform was the grain procurement and marketing system. The central government increased the grain purchasing price to stimulate grain production and to increase farmers' incomes. China's grain production reached the highest level of 512.30 million tons in 1998, rising from 304.77 million tons in 1978 (Table 6.3) and met the basic demand of grain consumption. At the same time, the grain purchasing price index increased more rapidly than the general retail price index. Farmers' incomes increased significantly. The second aspect of the reform was the grain rationing system. The government stabilized grain sale prices in urban areas by subsidizing grain sales so as to control the inflation rate and increase urban people's real incomes.

Before the reform of the grain marketing system in 1998, there were two major attempts to reform the grain procurement and marketing system. The first attempt to introduce the "contract procurement " system to replace the traditional "unified procurement" in 1985, and

the second one was "fixing the quantity and freeing the price" to replace the "state contract procurement" system in 1993. Both attempts were unsuccessful.

Table 6.3: China's Grain Output, Grain Purchasing Price Index and General Retail Price Index

Year	Grain Output (million tons)	Grain Purchasing Price Index (100=1978)*	General Retail Price Index (100=1978)
1978	304.77	100.0	100.0
1979	332.12	130.5	102.0
1980	320.56	140.8	108.1
1981	325.02	148.1	110.7
1982	354.50	153.7	112.8
1983	387.28	169.5	114.5
1984	407.31	189.8	117.7
1985	379.11	193.2	128.1
1986	391.51	212.3	135.8
1987	404.73	229.3	145.7
1988	394.08	262.8	172.7
1989	407.55	333.5	203.4
1990	446.24	310.8	207.7
1991	435.29	291.5	213.7
1992	442.66	306.9	225.2
1993	456.49	358.2	254.9
1994	445.10	525.1	310.2
1995	466.62	677.4	356.1
1996	504.54	716.7	377.8
1997	494.17	646.5	380.8
1998	512.30	625.2	370.9
1999	508.39	544.5	359.8
2000	462.18	491.2	354.4

Source: Statistical Yearbook of China, SSB
* calculated from the data in *Statistical Yearbook of China.*

During the late 1970s, there were four categories for state grain procurement: (1) "*zheng gou*", which referred to an in-kind agricultural tax; (2) "*ding gou*", which referred to fixed quota purchases; (3) "*chao gou*", which referred to above-quota purchases; and (4) "*yi gou*", which referred to negotiated purchases. In practice, the first two were combined into one and usually named as "*tong gou*", or "unified purchases". Sometimes this category was also entitled "quota purchases" for convenience. In 1979, the state raised the grain quota price by 20% on average. The third and fourth categories were combined into a new one, called negotiated purchases. The price for this new category was set at 50% over the quota purchases.

From 1956 to 1983, the grain quota price rose by 100.7%. Taking the above-quota premium and the increasing share of above-quota purchases, the average price increased by 229.0% (Carter and Zhong, 1989). On the other hand, during this period the retail price of grain remained the same in urban areas. The gap between the retail and purchase prices of grain widened to about 60—70%, with the retail price being lower than the purchase price. In addition, the government still paid the marketing costs for grain resale. Therefore grain subsidies grew sharply in the early 1980s. Table 6.3 indicates that there had been a series of good harvests since 1978. To purchase the extra grain was unaffordable to the central government. In 1984, the grain subsidies were 20.50 billion RMB *yuan,* which accounted for 13.65% of the national budgetary revenues (Carter and Zhong, 1989).

The new grain procurement system reflected three related factors: an unaffordable grain budget subsidy; an irrational price structure; and a series of good harvests. As part of the reform, indicators such as profits were in use as the major criteria to measure the performance of state-owned grain enterprises. Thus the state grain enterprises which were in charge of grain purchasing and reselling had been particularly interested in reducing their losses. In addition to purchasing extra amounts of grain at the above-quota prices, they had to use local funds to build new facilities to stock the extra purchases. These increased purchases often were made for consumers outside the local areas. This made matters worse. Therefore, in the surplus areas the enterprises were reluctant to purchase extra grain, causing farmers to complain of "difficulties in selling grain". The state grain enterprises even purchased grain through the use of "the white sheet (IOU)". A series of good grain harvests made the situation of "difficulties in selling grain" more serious. In some areas grain prices on the free market were even lower than the above-quota prices.

These practices made China's policy-makers believe that there was an oversupply of grain and some measures should be taken to change the agricultural production structure. Therefore, in 1985 a new policy was introduced - the "contracted purchases" system. This new system was aimed at shifting agricultural production towards a more rational allocation of resources, improving grain trade through the free market, and reducing the budget deficit. Consequently, on 1 January 1985, the Central Committee of the CCP and the State Council released a new policy called 'Ten Measures to Further Enliven the Rural Economy' (MoA, 1989). The first measure was to reform the state procurement system. In the case of grain, starting from the 1985 summer harvest, the use of "unified purchases" was cancelled while "contracted purchases" would be introduced. This new purchasing system, which was still controlled by the state, focused on agricultural crops such as rice, wheat, corn and soybeans. In fact, grain purchase contracts were not voluntary because the two parties to the contract were without equal power. On 24 January 1985, the State Council issued 'Regulations Regarding Agricultural and Sideline Products Purchasing and Marketing Contracts' (MoA, 1989). Under these regulations, the purchasing quantity of grain had to be set in accordance with the state unified purchase plan.

Under the new system the Ministry of Commerce, which was in charge of grain purchasing and whose local agencies were the state grain enterprises, would sign agreements with farmers before each planning season on the type and quantity to be purchased. The new price was decided by the state to be equal to the weighted average of quota and above-quota prices, with the quota accounting for 30% and the above-quota accounting for 70%. This ratio of 30-70 was set according to the fact that in 1984 above-quota purchases already accounted for 70% of the total government grain purchases. Therefore the new price should be kept at the previous level. If farmers still had surplus grain after fulfilling their "contracted purchases", they were free to sell products on the free market. State grain enterprises could buy the surplus grain in the market at the price determined by market forces if they wished to do so. If

the market price dropped below the former one, state grain enterprises were also obliged to buy all of the grain delivered by farmers at the former quota price.

The price according to the new policy was designed to reduce the government's subsidies for grain purchases, and in some areas it was designed to change the production structure in agriculture and to stimulate the production of cash crops. The new price meant that if the total quantity purchased by the state was exactly the same in 1985 as in 1984, farmers would receive the same average price for the grain they sold to the state, which was 35% higher than the former quota purchase price. However, compared with the former above-quota purchase price, the marginal price would be 10% lower in the case of "contracted purchases". Taking the former quota purchase price as the standard, farmers received a 50% premium for the last unit of grain they sold to the state in 1984, but only a 35% premium in 1985 (Carter and Zhong, 1989). This new pricing policy clearly discouraged farmers from planting and selling extra grain.

In 1985, grain production decreased greatly from 407.31 million tons to 379.11 million tons, a fall of 7 per cent. The causes of this decline included bad weather, low yields and a decrease in the sown area. In fact, the reduced marginal price to farmers was the main reason for the drop in grain production. The new grain procurement system clearly proved to be a policy misjudgement. Carter and Zhong (1989) calculated that 23.8% of the total grain production (391.51 million tons) was sold to the state in 1986. Of the total state purchases (93.18 million tons), about 35% was "negotiated purchases" and 65% was "contracted purchases". In contrast, approximately 3% of the total production was traded through free market channels. In practice, the contract purchasing system was equivalent to "unified purchases". However, the price structures were different. Under the old system, the marginal price was higher than the average price so the farmers were encouraged to produce and sell more grain. Under the new system, begun in 1985, the marginal price was the same as the average one, and 10%

lower than the previous marginal one. So farmers became motivated to sell their surplus in the free market or use it or hoard it themselves.

The decline in grain output in 1985 changed the overly optimistic opinion about grain production. The central government found it difficult to fulfil its contracted purchase plan in 1985. There was even a danger that grain production incentives might decrease further. Therefore, after only one year in operation, the new policy regarding the contracted purchases was revised. The contracted quantity was to be fixed for a three-year period. It was set at about 60.5 million tons in 1986 and was reduced further to approximately 50 million tons in 1987. The decline in the amount of the contracted purchases was not to protect farmers from a free market price which was too low, but rather to increase farmers' incomes and their incentives to grow more grain.

The other side of China's grain marketing system was the grain rationing system. The introduction of food coupons started in August 1955, and was aimed at controlling the demand for the mix of grain when providing cheap food to urban people. Starting in the late 1970s, due to increases in grain output, it was unnecessary to present food coupons when eating in restaurants, or when buying manufactured foodstuffs such as cakes or cookies. However, a 10—20% extra charge was normally added to the grain involved because this grain was purchased at either the above-quota or negotiated prices.

In 1985 the grain rationing system was changed in rural areas. Previously, some farmers such as CCP cadres, were officially recognized as non-grain producers and entitled to grain rations. They paid the same price as an urban resident by using food coupons. Now, they had to buy grain from the free market or the state stores paying the full cost which included the above-quota price and marketing cost. Others chose individuals such as fishermen and herdsmen who could still buy grain at the ration price with food coupons. The reason for this change

was that some farmers' products such as cash crops were no longer subject to state procurement. These farmers received full value for their products and could buy grain at the market price. This change was easily accepted because these farmers were always richer than others who produced grain. This measure reduced state subsidies for grain. At the same time, the grain rationing system in urban areas did not change. Individual urban residents still received their monthly grain ration.

After several years of recession in grain production, in 1989 the output level returned to that of 1984 (see Table 6.3). In 1991, China's grain marketing system was further reformed. With increasing incomes, the structure of food consumption changed significantly, with the direct consumption of grain declining and the consumption of pork, other meats, fish and eggs increasing. In 1964, the proportion of consumption of grain and edible oils in consumers' budgets was 24.25%, but in 1989 it was only 8.36% (*The China Quarterly,* 1991). In May 1991, the grain retail price increased by 67%. This meant that the selling price was only 17% below the procurement price. In April 1992, there was a further price increase, which brought the two prices into line (Watson and Findlay, 1999). Thus, food coupons gradually faded from the scene. At the same time, the central government still compensated the grain marketing and processing costs, by providing a subsidy of 0.40 RMB *yuan* per *jin* for ration grain (Li and Song, 1991). These price increases were clearly aimed at reducing the budget outlays for grain. To offset some increase in the grain retail price and maintain social stability, consumers' wages were raised by 6.00 RMB *yuan* (*The China Quarterly,* 1991) monthly. Therefore, the consumers absorbed the price increases calmly.

As in other Asian countries at a similar stage of economic growth, China began to focus on providing protection and support for grain producers (Anderson and Hayami, 1986). In this round of reform, the policy was designed to also improve production incentives. On the procurement side, in 1992 the central government raised the grain purchase price by 5.02%.

This policy was aimed at improving farmers' incomes substantially, but was not deployed in some areas. Attempting to increase their profits, state grain enterprises reduced purchases at the contract prices, and even worse, they paid farmers in the form of IOUs. Therefore, the benefits of increased purchase prices were eroded.

At the same time, the trend of decentralization accelerated. Local governments were allowed to decide when and where to liberalize the grain sales price. Furthermore, the liberalization of the price for state procurement was also permitted. In April 1991, the reform program was first tested in Guanghan county, Sichuan province (Sichuan Provincial Committee of the CCP and Sichuan People's Government, 1991). The reform aimed to make more use of the market mechanism set prices and production. In March 1992, Guangdong deregulated its markets. By the end of 1992 this experiment had spread to about 400 counties across the country. By August 1993 some 90% of all administrative areas had implemented some kind of reform (Watson and Findlay, 1999). In general this reform spread from the south to the north and from richer regions where the consumers' budget for grain was low and there was less concern about economic instability, to poorer regions which feared price changes and the spectre of economic instability. It was more likely that when one county reformed, neighbouring counties had to accept the change to avoid the potential problems of having two kinds of marketing systems existing side by side.

The upsurge in the retail grain price led to rampant inflation. In 1994 national urban consumer expenses increased by 24.1%, and food costs rose by 31.8%. Within food prices, grain consumer expense rose by 50.7%. Consequently, the general retail price index increased by 21.69% in 1994 and by 14.80% in 1995 (Guo, 1999). In some areas the reform was reversed by the end of 1993. In order to balance the decreasing living standard due to rising grain sales prices in urban areas, some cities reintroduced food coupons (even in Beijing). The central government also emphasized the importance of maintaining the dominant role of the state

grain enterprises in the grain market. This round of grain marketing system reform was unsuccessful as well.

These two rounds of grain procurement and marketing system reforms attempted to set up a market mechanism for grain production and trade. Without the right institutional development, the reforms failed. The central government wanted to reform China's economic structure gradually: social stability would be essential for economic reforms. Therefore, in order to maintain social stability, the central government preferred to adopt slow and safe policies to reform traditional systems. On the other hand, although the market-oriented economy was the goal of these reforms, policy-makers still had little confidence in the free market because they had little knowledge of it. When facing difficulties, they would rather use government measures instead of market forces to solve problems.

6.3. The Grain Marketing System Reform in 1998

In March 1998, Zhu Rongji was elected as the fifth Premier of the PRC at the National People's Congress. He put forward a comprehensive and ambitious plan for economic reforms such as the banking system, grain marketing system, reform of state-owned enterprises and slashing by half the public service.

6.3.1. The Introduction of the Grain Marketing System Reform in 1998

From 1998, a new round of reform of the grain marketing system was implemented.[5] There were several differences between this reform and the two previous reforms. A sound description of the basic features will help us understand this round of grain marketing reforms.

[5] This round of reform was very brash and sudden. Premier Zhu Rongji did not consult some experts. Before announcing the document in the *People's Daily*, even officials in the MoA did not know what was happening in the grain marketing system. The reform was formulated jointly by some officials of the General Office of the State Council and State Planning Commission. The leader in charge of this task was Ma Kai, then the vice-director of the General Office of the State Council. The reform was opposed by some officials and researchers.

Since the mid-1990s, China's grain supply has increased significantly. As shown in Table 6.3 China's grain production stayed at a level of approximately 500 million tons. A series of economic policies and measures after the great increase in grain prices in the early 1990s was adopted by the government to promote grain production, including extending and stabilizing the land responsibility contract to farmers, increasing grain procurement prices (39.9% in 1994 and 19.9% in 1995), encouraging farmers to grow better varieties of grain and using advanced cultivation technology, and implementing the Provincial Governor Responsibility System. Considering the demand for grain, although China's total grain consumption grew at a rate of an annual increase of 2 per cent due to a series of good harvests, the total grain supply exceeded total demand and led to continual growth in the grain stock (Wang, 2001).

In 2000, China's state-owned grain enterprises of all kinds held about 260-270 million tons of grain in storage, while farmers' surplus grain in stock themselves amounted to 220-230 million tons. Together there was c. 500 million tons of grain in storage, and this was approximately equal to one year's national grain production. Combining the factors of supply, demand and storage, a fundamental change in the situation of excessive supply in Chinese grain market in the near future was not expected.

A series of good grain harvests and the resulting surplus provided the same background for the 1998 round of reform and the previous two grain marketing system reforms. However, the grain supply since the mid-1990s had been in continuous surplus (Wang, 2001). This situation of having an all-round surplus, which was different when compared to the previous two grain marketing system reforms, meant that any potential for change in the agricultural production structure was small.

As described earlier in this chapter, the grain purchase price and the general retail price index had a positive relationship, and the increase in grain purchase price could lead to inflation,

because the share of the consumption of grain in consumers' budgets was large. From 1997, the grain purchasing price index decreased (see Table 6.3). Wen (1999) calculated that the purchasing power of all commodities of an urban household was almost three times that of a rural household. The decline in the grain purchase price led to a slower growth of rural incomes. Thus, rural households' demands for commodities other than foods were negligible. In 1998 deflation appeared (see Table 6.3) and this hampered economic development. Since the mid-1990s a prominent feature of China's agricultural development has been that farmers' incomes have declined despite the fact that the volume of agricultural production has increased remarkably. In 1996 the growth rate of farmers' per capita incomes was 9 per cent, but in 2000 it was only 2.1 per cent. Therefore, the income difference between rural and urban residents increased from 2.5:1 in 1996 to 2.8:1 in 2000, and reached the highest level since the economic reform (Wang, 2001). The widening income gap between rural and urban residents has led to social instability.

Since the economic reform, the pattern of China's domestic grain trade has changed greatly. For example, in the past the eastern coastal areas and western areas were net grain outflow areas. Now they have increasingly become net grain inflow areas. The base of grain production and supply has moved towards the central and northern areas. The changing patterns of China's grain production and trade could be attributed to this imbalance of regional development and changes in the division of labour. Although the government has strongly intervened in the grain market since the mid-1990s, the degree of integration between regions has increased. At the same time, more and more non-state-owned grain enterprises and individual and private grain dealers have participated in the grain trade, which not only broke the dominant role of state-owned grain enterprises and increased the competition and efficiency in the grain market, but also made the current grain marketing policies look inefficient. After China's entry into the WTO and facing more challenges from international trade, the current grain marketing system will become more complicated.

In order to reform the grain marketing system further, to control the declining trend of grain prices in the market, and to help farmers overcome their difficulties in selling grains and to increase their incomes, China's State Council issued the 'Decision on Deepening the Reform of Grain Marketing System' in June 1998 (*People's Daily*, 4 June 1998). This policy development required efforts to be made in reforming the grain marketing system with "three policies and one reform" as the basic elements. The main contents of the new measure are as follows.

(1) Three policies:

A. *To purchase farmers' surplus grain at the protection price.*

The state-owned grain purchasing and storing enterprises are required to purchase farmers' surplus grain at the protection price. Except for the state-owned grain purchasing and storing enterprises, individual, private and other enterprises are prohibited from purchasing grains directly from the farmer. This policy is the core element of the grain marketing system reform. The protection price should be set according to the quality of grains that the farmers want to sell. State-owned grain purchasing and storing enterprises should not degrade grains and should not set any limit on the amount that farmers want to sell.

B. *To sell grain at a reasonable price by state-owned grain purchasing and storing enterprises.*

State-owned grain purchasing and storing enterprises should sell grains at a reasonable price based on the purchasing price plus reasonable profits. Enterprises should be responsible for their own profits and losses.

C. *Enclosed operation fund for grain purchasing.*

In order to avoid the use of "white sheets (IOUs)" in grain purchases, the policy aims to prevent grain purchasing and storing enterprises from using funds for other purposes. The

Agriculture Development Bank of China (ADBC) which is in charge of the grain purchasing fund will manage the fund by means of "connecting the storage and loans" and "returning money after the sales of grains", ensuring that all principals and interests on the loans are paid back to the ADBC.

(2) One reform:

To accelerate the reform of the state-owned grain enterprises.

State-owned grain enterprises should be reformed further. They should be changed into market-oriented enterprises to improve their management methods, increase their competitiveness in the market place by reducing personnel and distribution costs and take sole responsibility for their profits or losses.

From the very beginning, this new grain marketing system has been debated by economists both domestically and abroad (Yang, 1999). After more than two years implementation, the reform can be understood well. By using the results of the household survey data, the next section attempts to evaluate the reform. The household survey was jointly conducted by the University of Adelaide and the Ministry of Agriculture in China in 1999 and 2000 after the recent grain marketing system reform policies were introduced. The data was collected from five provinces - Jilin, Jiangxi, Shandong, Sichuan and Henan. From each of these provinces, four counties were chosen. The counties chosen in the sample are mainly grain producing areas.

6.3.2. Process of Grain Marketing System Reform since 1998: The Household Survey Results

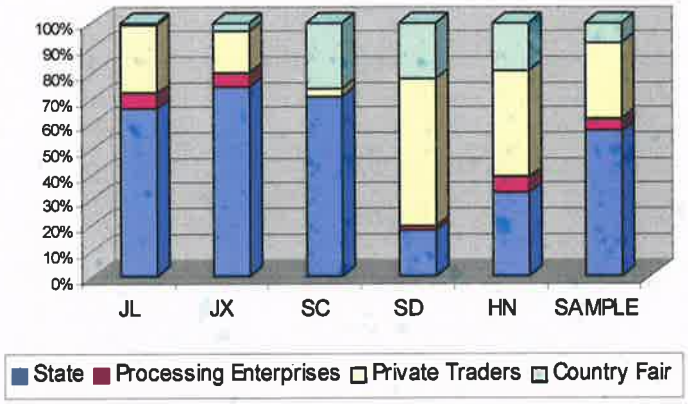
Cheng (1996) utilized the household survey data to study China's grain marketing system reform in 1993-1994. In his paper, he examined three major aspects of China's grain marketing system reform, namely, changes in the degree of commercialization, changes in

state contract procurement quotas, and changes in marketing channels. Taking into account the features of China's grain marketing system of this round, two aspects of the grain marketing system, i.e. changes in the marketing channels and changes in the grain stock, will be analysed.

6.3.2.1. Changes in Market Channels

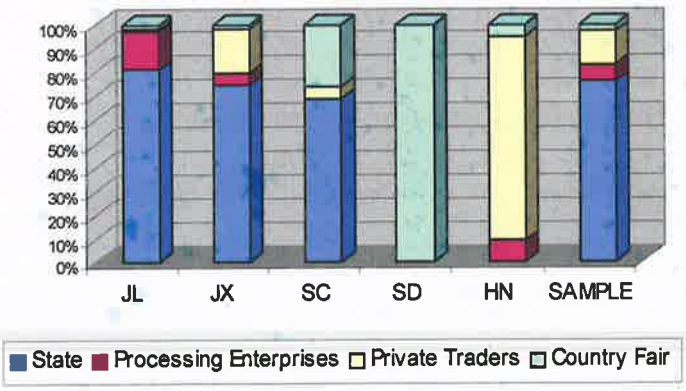
For easy understanding, charts are used to depict the changes in this area of China's grain marketing system reform. The detailed data is enclosed in Appendix B.

Figure 6.1: Sales of All Grains by Type of Buyers, 1999



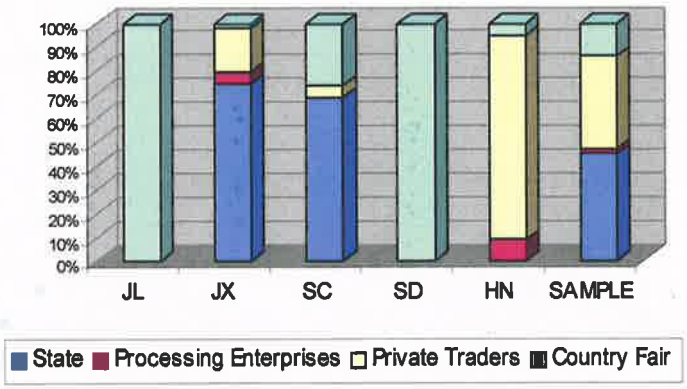
Source: Household Survey

Figure 6.2: Sales of Rice by Type of Buyer, 1999



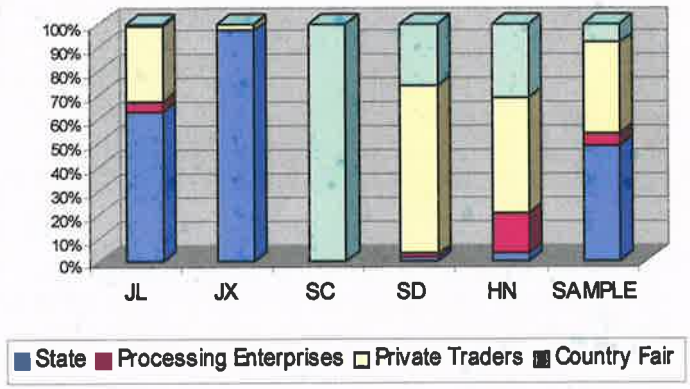
Source: Household Survey

Figure 6.3: Sales of Wheat by Type of Buyer, 1999



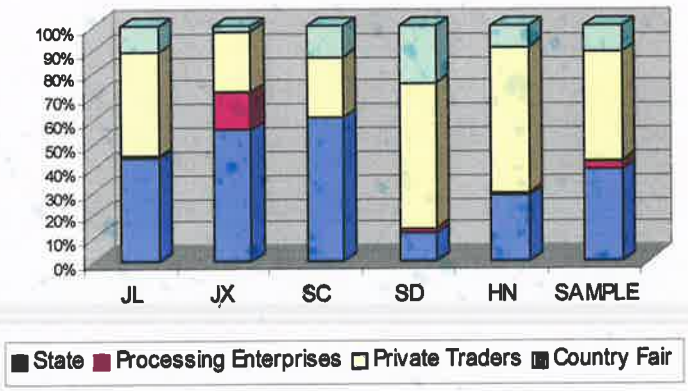
Source: Household Survey

Figure 6.4: Sales of Corn by Type of Buyer, 1999



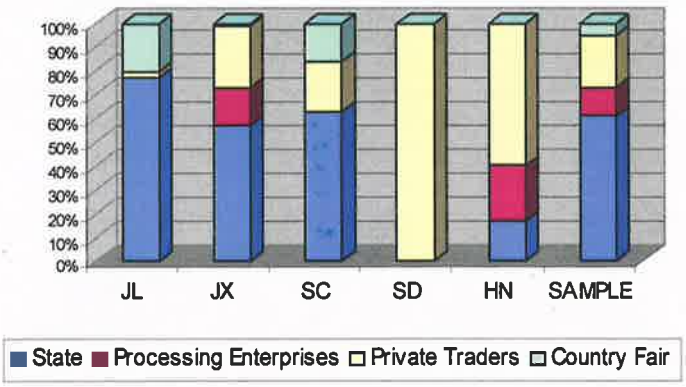
Source: Household Survey

Figure 6.5: Sales of all Grains by Type of Buyer, 2000



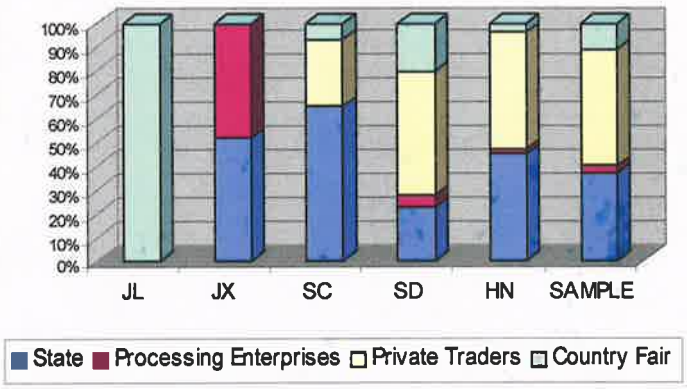
Source: Household Survey

Figure 6.6: Sales of Rice by Type of Buyer, 2000



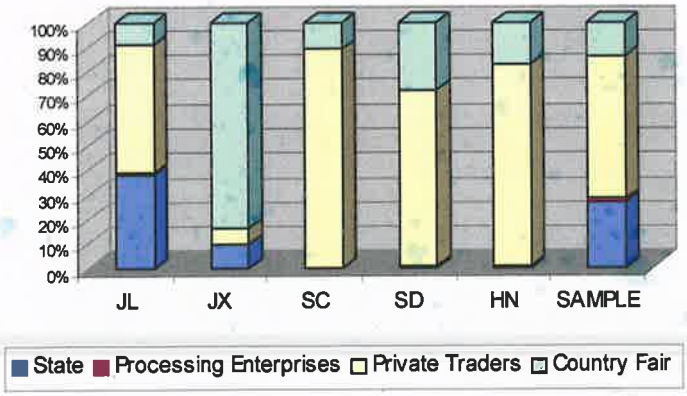
Source: Household Survey

Figure 6.7: Sales of Wheat by Type of Buyer, 2000



Source: Household Survey

Figure 6.8: Sales of Corn by Type of Buyer, 2000



Source: Household Survey

As noted in section 6.3.1, except for the state-owned purchasing and storing enterprises, other individual and private enterprises were banned from purchasing grains directly from farmers. In Figures 6.1 and 6.5, it can be observed that the aim of state monopoly of the grain market had still not been attained. In 1999, the share of all grains purchased by the state, processing enterprises, private traders and country fairs in these five provinces were respectively 57%, 5%, 30% and 8%. In 2000, the shares were 39%, 4%, 46% and 11% respectively. In 1999 and 2000, the shares of all grains purchased by private traders and in country fairs were 38% and 57% respectively.[6] In contrast to the reform's aim, the share of grain purchased by the state decreased further and the share of grain purchased by private traders and in country fairs grew significantly. During the same period, the share of grain purchased by the processing enterprises was maintained at 5% and 4% in 1999 and 2000 respectively.

Figures 6.2, 6.3, 6.4, 6.6, 6.7 and 6.8 indicate that the grain market in Shandong province was the most liberalized of the five provinces, in which the share of grain purchased by private traders and in country free fairs was 80% in 1999 and 86% in 2000. The grain market in Jiangxi province was the least liberalized and the share of grain purchased by private traders and in country fairs was 20% and 28% in 1999 and 2000 respectively. The share of all grains purchased by the state in these five provinces declined further from 66%, 75%, 71%, 18% and 33% in 1999 to 44%, 56%, 61%, 12% and 28% in 2000 in Jilin, Jiangxi, Sichuan, Shandong and Henan provinces respectively.

For the main crops of rice, wheat and corn, the shares purchased by the state in these five provinces decreased from 76%, 45% and 49% in 1999 to 61%, 37% and 27% in 2000. Compared to wheat and corn, rice was the least liberalized commodity. In 1999, only 17% of the total marketed rice was purchased by private traders or in country fairs. In 2000, there was

[6] In the household survey, farmers did not differentiate the processing enterprises between the state-owned and the non-state-owned . Taking this factor into account, the share of total grains purchased by private, and other enterprises should be much higher.

renewed growth and it reached 27%. In 1999, wheat was the most liberated commodity compared to the other two grains and the share of wheat purchased by private traders or in country fairs was 53%. In 2000, corn was the most liberalised and the share purchased by private traders or in country fairs was 72%.

The prices offered by different market players for major crops are presented in Table 6.4. In 1999, the prices of wheat offered by processing enterprises, private traders and country fairs in Sichuan, Shandong and Henan provinces were all lower than that of the state purchases. In 2000, the prices of rice offered by processing enterprises, private traders and country fair in Jilin, Jiangxi and Sichuan and Henan provinces were equal to or lower than that of the state purchases. However, the differences between the prices offered by the state and by other market players in 1999 and 2000 were not large. Compared to the price of state purchases, the largest gap in 1999 was the price of corn which was offered in a country fair in Jilin province (81% of the state price). In 2000, the largest gap was created by the price of corn offered by the processing enterprises in Jilin at 141% of the state price. Due to a series of good grain harvests, compared to 1999, the prices of state purchases of most grains in the surveyed provinces declined further in 2000 except for rice in Jilin (only 0.01 RMB *yuan/jin*, at a rate of 1.69%). As discussed in section 6.3.1, the state's grain purchasing price index decreased by 12.91% in 1999 and this caused the purchasing price offered by other market players to decline as well. A series of good grain harvests, low consumption of grain and an overall low economic growth rate for China all contributed to this phenomenon.

Table 6.4: Prices Offered by Different Market Players for Major Crops in 1999 and 2000

	Price (RMB *yuan*/jin)				Relative Price (state price=1.00)		
	State	Processing Enterprises	Private Traders	Country Fair	Processing Enterprises	Private Traders	Country Fair
RICE (1999)							
Whole Sample	0.52	0.53	0.52	0.51	1.02	1.00	0.98
JL	0.59	0.50	0.59	0.55	0.85	1.00	0.93
JX	0.54	0.56	0.52	0.56	1.04	0.96	1.04
SC	0.46		0.50	0.47		1.09	1.02
SD				0.38			
HN		0.50	0.35	0.42			
WHEAT (1999)							
Whole Sample	0.56	0.53	0.51	0.52	0.95	0.91	0.93
JL			0.46	0.43			
JX							
SC	0.56		0.40	0.52		0.71	0.93
SD	0.59	0.56	0.53	0.54	0.95	0.90	0.92
HN	0.55	0.51	0.49	0.49	0.93	0.89	0.89
CORN (1999)							
Whole Sample	0.33	0.34	0.36	0.40	1.03	1.09	1.21
JL	0.31	0.29	0.27	0.25	0.94	0.87	0.81
JX		0.58		0.45			
SC				0.57			
SD	0.45	0.40	0.41	0.41	0.89	0.91	0.91
HN	0.35	0.38	0.36	0.37	1.09	1.03	1.06
RICE (2000)							
Whole Sample	0.54	0.51	0.53	0.60	0.94	0.98	1.11
JL	0.60		0.59	0.62		0.98	1.03
JX	0.54	0.51	0.53		0.94	0.98	
SC	0.43		0.43	0.43		1.00	1.00
SD			0.41				
HN	0.52	0.52	0.51		1.00	0.98	
WHEAT (2000)							
Whole Sample	0.38	0.35	0.40	0.40	0.92	1.05	1.05
JL				0.57			
JX	0.50						
SC	0.51		0.47	0.50		0.92	0.98

Continued:

SD	0.38	0.38	0.45	0.43	1.00	1.18	1.13
HN	0.40	0.47	0.44	0.44	1.18	1.10	1.10
CORN (2000)							
Whole Sample	0.34	0.32	0.41	0.38	0.94	1.21	1.12
JL	0.22	0.31	0.30	0.22	1.41	1.36	1.00
JX	0.56	0.57		0.55	1.02		0.98
SC			0.48	0.70			
SD	0.40		0.36	0.36		0.90	0.90
HN		0.50	0.38	0.38			

Source: Household Survey

6.3.2.2. Changes in Grain Stocks

The stocks of rice, wheat and corn grew by 315.45 *jin,* 66.66 *jin* and 308.8 *jin* per household in 1999. In 2000, stocks of both rice and wheat increased by 86.99 *jin* and 80.05 *jin* per household. Stocks of corn in 2000 decreased by an amount of 36.22 *jin* per household which was smaller compared with the year-end stock of corn at 1329.22 *jin* in 1999 and 1293.00 *jin* per household, respectively. For these two main grains, the increase in the stock of rice in 1999 was more than that in 2000, at 315.45 *jin* in 1999 and 86.99 *jin* per household in 2000. On the other hand, the stocks of wheat increased slightly, from 66.66 *jin* in 1999 to 80.05 *jin* per household in 2000.

In 1999, stocks of the three main grains, rice, wheat and corn, in each surveyed province all increased. In Henan the stocks of corn grew significantly by 563.98 *jin* per household, which took about half of the year-end stock in 1999. In 2000, the situation for all these grains in the five provinces became complicated. The stocks of rice, wheat and corn in Jilin all decreased by 98.26 *jin,* 36.76 *jin* and 7.19 *jin* per household respectively. In Henan the stock of corn declined by 363.88 *jin* per household and the largest decrease in amount in 2000 was the decline of wheat in Jiangxi by 566.66 *jin* per household. That was more than half of the year-end stocks in 1999.

According to Wang (2001) state-owned grain enterprises in Jilin province had stored 36 million tons of grain by the end of March 2000, 8.5 million tons more than the previous year, exceeding the normal grain storage capacity by 17 million tons. The state-owned grain enterprises in Heilongjiang province had a storage capacity of 26.5 million tons. By the end of March the grain stored had reached 42.5 million tons. Lacking the required grain storage capacity in these two provinces, excessively purchased grains had to be stored in an open courtyard with only the simplest protection. Zhang and Liu (2001) investigated Nanfeng County in Jiangxi province where, because of the lack of grain stock capacity, the state-owned grain enterprises could not purchase all the surplus grain that farmers wanted to sell.

Although there were no great differences in prices offered by the different market players, namely the state, private traders, processing enterprises and country fairs, grains were usually purchased by private traders and in the free country fairs rather than the state in these five provinces during 1999-2000. A combination of good grain harvests and limited grain stock capacity in state-owned grain enterprises could explain the decline in state purchases of grain and the increase in purchases of grain by private traders and in country fairs. Table 6.5 presents the data on stock changes and year-end stock of grains.

Table 6.5: Stock Changes and Year-end Stock (Jin/Household)

Stock changes in 1999			
	Rice	Wheat	Corn
Sample	315.45	66.66	308.8
Jilin	107.74	47.02	422.4
Jiangxi	418.79		
Sichuan	327.02	51.68	20.84
Shandong		69.71	343.13
Henan	464.21	171.61	563.98

Stock Changes in 2000			
	Rice	Wheat	Corn
Sample	86.99	80.05	-36.22
Jilin	-98.26	-36.76	-7.19
Jiangxi	96.68	-566.66	
Sichuan	207.88	164.05	-31.11
Shandong		26.76	218.24
Henan	116.8	49.22	-363.88

Year-end stock in 1999			
	Rice	Wheat	Corn
Sample	1611.81	932.99	1329.22
Jilin	1439.22	251	2315.3
Jiangxi	1830.33	1125	
Sichuan	1542.2	201.8	172.18
Shandong		1168.23	781.69
Henan	678.5	1437.5	1281.63

Year-end stock in 2000			
	Rice	Wheat	Corn
Sample	1698.80	1013.04	1293.00
Jilin	1340.96	214.24	2308.11
Jiangxi	1927.01	558.34	
Sichuan	1750.08	365.85	141.07
Shandong		1194.99	999.93
Henan	795.30	1486.72	917.75

Source: Household Survey.

6.3.3. Conclusion about the Grain Marketing System Reform in 1998

The reform of the grain marketing system in 1998 aimed to monopolise the government's sale and purchase of grain. This policy was not well planned, nor in line with the goal of creating a

market-oriented economy, and did not consider China's situation at that time. Since 1995 there was a series of good grain harvests and the demand for grain decreased. At the same time the expectation was that demand on grain would not increase. The main implementers of this policy, the state-owned grain enterprises, wanted to pursue profits. The excess stocks of grain meant more demand on facilities and funds. Although the Agriculture Development Bank of China provided the necessary funds for the purchase and storage of excessive grains, the interest paid was a large burden to these enterprises. Thus, the more that state-owned grain enterprises stocked, the more they lost. Therefore, the state-owned grain enterprises wanted not only to purchase less grain from farmers but also to sell grain stock at a reduced price, which could not even compensate for the cost of purchasing and storage.

Since the mid-1980s farmers could sell their own products after fulfilling their obligations to the government. Thus the free market, individuals and private grain enterprises supplemented the market channels of grain that were controlled by state-owned grain enterprises. These non-state-owned grain enterprises could provide farmers with better services. For example, they could purchase grains at the gate of a farmer's house, which could decrease his transactions costs. They always paid cash for the grain they purchased, and as described above, in many areas, the state-owned grain enterprises only paid IOUs to farmers. Non-state-owned grain enterprises were preferred by the farmers. The new grain marketing system prohibited these non-state-owned enterprises from making purchases and sales of grain, but was impossible to implement because this policy required large monitoring and enforcement costs.

From the empirical evidence gathered from the household survey data for the five provinces in which grain cultivation was the main activity, it can be concluded that the 1998 reform was not be suitable for China's agricultural economy.

6.4. The Reforms Experiments in the Grain Marketing System since the End of 2000

As discussed in section 6.3, the new round of grain marketing system reforms did not improve grain production or increase farmers' incomes. Based on the two years' use of this policy, at the end of 2000 further experiments to reform the grain marketing system were carried out. The experiment first took place in the coastal provinces which are the grain importing areas, then in the inland provinces which are grain exporters.

6.4.1 Experiments in the Grain-Importing Provinces

In December 2000, when Prime Minister Zhu Rongji visited Zhejiang province, he pointed out that Zhejiang could try an experiment in the grain marketing system, to adjust its agricultural production structure and use market forces to determine the purchase and sale of grain. Thus, a new round of reform of the grain marketing system began. By the end of 2001, Shanghai, Jiangsu, Fujian, Hainan, Beijing and Tianjin also adopted the same policy that was first implemented in Zhejiang. Market forces now determined grain production, purchases and sales. In response to price signals the farmers could produce any crop that met demand and sell it to any enterprise which offered a higher price. As for grain, the state-owned and non-state-owned enterprises shared the same status for purchasing grain.

This new policy also led to many debates within the government (Wang, 2001). Some believed that grain production was very important and this new policy should be implemented carefully because the output of grain had decreased yearly since 1999. Others thought that firstly, after entry into the WTO the new policy would lead to changes in the agricultural production structure and increase farmers' incomes and secondly, that in 2001 the output of grain would be better than that of 2000.

The same features shared by these reformed provinces were that the agricultural share in total GDP was small, there was no comparative advantage in grain production and, except for Jiangsu province, which could basically meet the demands on grain consumption, they all imported grain from other provinces. This experiment has been conducted in only a short period of time so it is not possible to evaluate it properly. It is very doubtful, however, that the new policy can be extended to some provinces that have comparative advantage in grain production, so that their agricultural share in the total GDP could become relatively large, and able to export grain to other provinces. Upon entry to the WTO, China's agricultural sector would face international competition with no comparative advantage in grain production. If the grain-inflow provinces imported grain from the international market, the grain-outflow provinces would have fewer incentives to produce more grain. On the other hand grain-outflow provinces would need more funds to build facilities for storing grain. Without government support it will be difficult for the provinces to accumulate the funds themselves.

6.4.2 Experiments in the Grain-Exporting Provinces

In 2002, according to the State Council's document (No. 28) entitled 'Some Suggestions to Deepen the Reforms of Grain Marketing System Further', the reforms in the grain marketing system extended to Anhui, Henan, Hubei, Hunan and Jilin provinces. According to this decree, the five provinces could select one or two cities or counties and reform the grain marketing system in some way. The principle aim of the document was to change the direction of grain subsidy from state-owned grain enterprises to the farmer, i.e. the indirect subsidy of grain was changed to a direct subsidy.

According to the principles of the grain marketing system in 1998, state-owned grain enterprises used the protection price to purchase any grain that the farmer wanted to sell. The government used the protection price to subsidise farmers. This kind of subsidy is an indirect subsidy because the subsidy reaches the farmer through the grain enterprises. The purpose of

the experiment in these five provinces was to directly subsidise the farmer. In the following section, the experiment in Anhui province is used as a case study.

In April 2002, Tianchang City and Laian County in Anhui were selected for the experiment of reforming the grain marketing system (*Economy Daily of China's Counties*, 21 November 2003). Following the initial success in Tianchang and Laian, the experiment was extended to other parts of Anhui province on 1 June, 2003. The provincial government adopted the policy of "two openings and one adjustment" policy (*New Capital Daily*, 18 February 2004; *Economy Daily of 21st Century*, 30 July 2003):

Two openings: 1). To open the grain purchase price. The state-owned grain enterprises use the market price instead of the protection price to purchase grain from the farmer. State-owned grain enterprises assume sole responsibility for their profits and losses. The Agriculture Development Bank of China checks the sale contract between state-owned grain enterprises and other enterprises, making sure that the purchased grain can be sold, and then grants the loan to them. 2). To open the grain purchase market and to allow other parties such as private traders and private grain-processing enterprises to engage in purchase of grain.

One adjustment: To adjust the grain subsidy approach, changing from an indirect subsidy through the absolute purchase with the protection price by the state-owned grain enterprises to the direct subsidy to each household. The subsidy comes from the grain risk fund.

In Anhui the state-owned grain enterprises lost their dominant role in the grain market, i.e. the farmer could sell his products to anyone at the highest price. At the same time, to guarantee grain production, the government subsidises the farmer directly. The amount is decided by the following formula (Lan, 2003; *New Capital Daily*, 18 February 2004):

A= B*C*D

A: the amount each household can acquire;

B: the marketed grain per *mu* in this county or whole province as the constant;[7]

C: the price gap between the protection price and market price which is decided by the provincial government according to the market survey; and

D: the county government can choose any measure of follows as D: 1). the acreage per household that should pay the agricultural tax; 2). the constant grain production per household that should pay the agricultural tax; or 3). the proportion of the previous two approaches decided by the county government.

This formula has no relationship with the current grain production and market channel, only a relationship with the purchased amount using the protection price in the past.[8] The subsidy amount is thus constant. This approach in Anhui is the same as used in the United States and European Union (*Economy Daily of 21st Century*, 30 July 2003). According to one report (*New Capital Daily*, 12 February 2004), in 2003 per *mu* could get 26 RMB *yuan* in Lujiang County and 12 RMB *yuan* in Wuwei County. With more competition between state-owned grain enterprises and private traders, the grain purchase price increased, so farmers' incomes from the sale of grain in 2003 increased by 12.5 million RMB *yuan* in Tongcheng City. In the same year, the state-owned grain enterprises profited by 16.21 million RMB *yuan.* In 2003, the total subsidy was 0.627 billion RMB *yuan*, accounting for 36% of the total grain risk fund, and each farmer could get 14 RMB *yuan.* This method of direct subsidy not only increased farmers' incomes but also reduced government expenditure. The central government appropriated several 10 billion RMB *yuan* as the grain risk fund every year, but 60% was used as the interest payout of the state-owned grain enterprises and only one third was used as

[7] In 2002, this constant was decided at the county level and then was extended to the provincial level in 2003.
[8] The subsidy methods used in other provinces such as Hubei and Henan. They still use the indirect subsidy linked to the production and the amount sold to the state-owned grain enterprises of each household .

the protection price. The Finance Department of Anhui raised 4 billion RMB *yuan* for grain purchase every year, but farmers only received 0.4 billion RMB *yuan* (*Economy Daily of 21st Century*, 30 July 2003).

In February 2004, the Central Committee of the CCP and the State Council jointly issued a document entitled 'The Policy Recommendation on Promoting the Increase of Farmers' Income' (*People's Daily*, 9 February 2004). According to this document the grain purchase and sale market would be completely opened throughout China. At the annual conference of the National People's Congress in March 2004 (*Xinhua News Agency*, 18 March 2004), Premier Wen Jiabao emphasised the importance of the openness of the grain purchase and sale market, and 10 billion RMB *yuan* would be appropriated from the grain risk fund to subsidise farmers.

This direct subsidy stirred debates among experts. Justin-Yifu Lin (*Nanfang Weekend*, 17 July 2003) thought that the central and local governments could not sustain subsidising farmers, and it would create an oversupply of agricultural produce as had occurred in the United States and Europe. Jikun Huang (*Economy Daily of China's Counties*, 21 November 2003) suggested that a direct subsidy not only increased farmers' incomes but also reformed state-owned grain enterprises.

According to the promise made by China negotiated with the United States before its entry into the WTO, the subsidy can amount to 8.5% of agricultural production value[9] (*Daily of Farmers*, 10 January 2002). In 2001, the subsidy was 86.4 billion RMB *yuan,* only accounting for 3.3% of total agricultural production value, 2618 billion RMB *yuan* (http://www.cfi.net.cn, 30 December 2003). The subsidy is 222.53 billion RMB *yuan* if it reaches 8.5%. This amount

[9] The United States regards China as a developed country so the amount of subsidy should be 5% of total agricultural production value, but China's authorities believe their country is a developing one and the subsidy should be 10%. After many rounds of negotiation, a compromise figure of 8.5% was reached.

is 25.9% of the central government's financial revenue (858.27 billion RMB *yuan*) or 12.5% of the central and local governments' financial revenue (1638.6 billion RMB *yuan*) (SSB, 2002). This 8.5% subsidy is a burden. Even in 2003 the central and local governments' financial revenue reached 2170 billion RMB *yuan* (*Daily of China's Youth*, 7 March 2004) and in case of the subsidy retaining its 2001 level, the ratio is still as high as 10.25%. Although this ratio is lower than the ratio of 13.65 of grain subsidy on national budgetary revenue in 1984 (Carter and Zhong, 1989), it is still a huge burden for the government. The proposal of some experts that the government should increase the subsidy to 8.5% of total agricultural production value in order to increase farmers' incomes is doubtful.

6.5 Conclusion

Since 1978 many measures have been implemented to reform the grain procurement and marketing system in order to create a market economy. It did not enforce agricultural production and did not increase farmers' incomes. The central government increased the grain purchase price several times in order to create incentives for producing more grain. In 1984 the "contracted purchase" system was implemented. In the early 1990s the grain rationing system and food coupons were gradually abolished in the cities. The sale price of grain was nearly equal to the purchase price, which decreased the central government's budgetary burden of subsidising grain and other agricultural products. In 1998, a new policy that aimed to monopolize the grain purchases and sales was adopted. Since the end of 2000, in coastal and rich provinces an experiment to use market forces to determine grain production, procurement and sales was carried out. Since 2002 the experiment has been extended to the grain-outflow provinces. The main feature of the experiment in grain-outflow provinces was to change the dominant role of state-owned grain enterprises in the grain market and to use direct subsidies instead of the original indirect subsidy to stimulate agricultural production.

Although the problem of feeding China has been fundamentally solved, grain supply security is still a very important issue for the country's policy-makers. As discussed in Chapter 4, since the adoption of the Household Responsibility System, the basic unit of agricultural production has been the individual household, and small-scale production is still very common in China's rural society. The individual household cannot respond very sensitively to price signals. In the grain marketing system, there are four parties: producers, consumers, enterprises and governments. They want to improve their profits at the other parties' expense. The government wants farmers to provide grain to feed the people. The farmers want to sell their products at higher prices. Consumers want cheap grain. Enterprises that are situated between producers and consumers want the highest profits possible. Of these four parties, the farmer is the weakest link.

Since the reforms, state-owned grain enterprises have gradually become the economic unit and pursued their own profits. Before 1978 and during the early phase of the economic reform, their incomes had no relationship to their performance. Since the mid-1980s, the profits produced by the enterprises were set as the criteria to monitor their performance, thus a worker's income in the enterprise was linked to profits. At the same time the state-owned grain enterprises were still the instruments used by the government to achieve certain goals, such as obtaining grain, storing grain and stabilising grain purchase and sale prices. Judging by the reform implemented in 1998, it has been noted that because the government's interests and those of the state-owned grain enterprises differed, the policy was not effective.

Although the central government has decided to extend this round of the grain marketing system reform to the whole of China, the results need further research. Zhou Xiaochuan, President of the Central Bank, the People's Bank of China, warned that the economy would be overheated this year and credits should be strictly controlled (*Commercial Daily of China*, 12 February 2004). In 2003, the growth rate of GDP was 9.1% (Wen Jiabao's work report),

but the real GDP could be higher. So, in Jiabao's report, the planned growth rate of 1994 is about 7% in order to avoid the national economy becoming overheated. In fact the retail price of grain began to soar in 2004 after the Spring Festival (21 January). In the author's hometown, Zhenjiang City in Jiangsu province, the price of rice doubled. In the supermarkets of Shanghai where the author now lives, he has witnessed customers rushing to purchase rice, edible oil and other food in anticipation of inflation. People remember what happened in 1994.

If grain production in 2004 does not improve and the retail price rises quickly, the output of this round of grain marketing system reform will be substandard. Going by past experience, the dominant role of state-owned grain enterprises will continue and direct subsidies to farmers will return to the original indirect subsidies.

CHAPTER 7

PROBLEMS OF FARMERS' INCOMES

7.1. Introduction

Inequality in distribution of income has the potential to destabilize any society. In China, as early as 993—995 A.D. during the Northern Song Dynasty (960—1126 A.D.), a peasant uprising occurred in Sichuan led by Wang Xiaobo. The slogan of this peasant uprising was "Let's share the wealth equally!" (Wu, 1945). For centuries before the PRC was established, peasant uprisings have tried to create a society where incomes were distributed equally.[1] In the tension between efficiency and equality throughout Chinese history, the common people and their feudal leaders have always put equality before efficiency (Huang, 2000). This historical practice induced China's Communist leaders to implement various methods in equalising wealth distribution before the economic reforms of the late 1970s.[2] This policy effectively brought this long tradition to a halt and China's leaders began to favour efficiency before equality. As Deng Xiaoping often remarked, "Let some get rich first (*rang yi bu fen ren xian fu qi lai*)".

Rising inequality in incomes has been a common feature of international economic development in recent decades, and China has been no exception. From being one of the world's most egalitarian societies in the 1970s, China in the 1980s and 1990s became one of the most unequal in Asia and among all developing countries generally (Riskin et al., 2001). This retreat from equality has been unusually rapid. China's leaders regarded the income distribution of the collectivist era, before the late 1970s, as having been excessively

[1] During the later period of the Ming Dynasty (1368—1643 A.D.), the slogan of the peasant uprising leader Li Zicheng was, "Don't worry about poverty, but worry about inequality (*Bu Huan Gua Er Huan Bu Jun*)!" (Wu, 1945).

[2] Stalin always thought the Chinese Communist Party's revolution was a 'margarine revolution', meaning that China's revolution was a peasant one rather than a truly socialist or communist revolution (Huang, 2000).

egalitarian. Then they openly promoted greater inequality with the slogan, "Let some get rich first". This policy development encouraged economic growth through different income incentives and permanently changed the structure of how income was distributed, especially for urban and rural people. Seldom had the world witnessed as sharp and fast a rise in inequality as occurred in China (Gustafsson and Li, 2001). Economic inequality leads to inequality in social status. Increasing economic and social inequality has therefore been an important issue in the generally positive story of rapid growth accompanying economic reform and change. The sustainability of that, however, has been accompanied by the spectre of social instability and therefore questioned.

In 2000 the ratio between per capita average annual income of rural and urban households was 1:2.79, while in 1984 it had been,1:1.83 (SSB, 2001). Thus, the gap between rural and urban people has widened further since the reforms. At the same time, there was also inequality in income distribution among farmers. In 1998 and 1999, the Gini coefficient[3] of the per capita net income of one farmer was 0.3309 and 0.3397 respectively (Han, 2001). There were also differences in rural incomes in different regions. In 2000, the per capita net income of farmers in the eastern, middle and western regions was RMB 2993.6, 2029.9 and 1556.6 *yuan,* respectively (Han, 2001). The current inequality in distributed income is very serious. It can hamper social stability and impede further economic growth.

It has been stated that "China is one of the most unequal countries in Asia" (Khan and Riskin, 1998; World Bank, 1997). The increasing contribution of the growth of rural non-agricultural activities to overall rural incomes can be explained by uneven regional development (Zhang, 2001). Non-agricultural activities include employment in Township and Village Enterprises (TVEs) and people migrating to urban areas to work for higher incomes. The development of

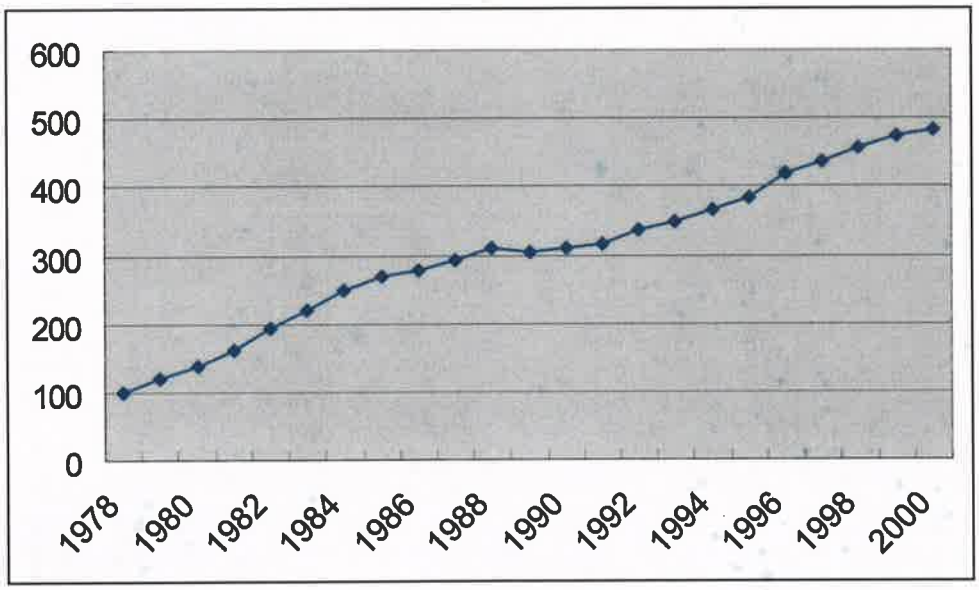
[3] A measure that shows how close a given distribution of income is to absolute equality or inequality. Named after Corrado Gini, the Gini coefficient is a ratio of the area between the 45-degree line and the Lorenz curve and the area of the entire triangle. As the coefficient approaches zero, the distribution of income approaches absolute equality. Conversely, as the coefficient approaches 1, the distribution of income approaches absolute inequality.

TVEs and the migration of farmers to urban areas affected the growth of farmers' incomes and their distribution. On the other hand, due to the large rural population and the biased agricultural policy adopted by China's policy-makers since 1949, agricultural production in the near future will still be the main source of income for most farmers. Since 2001, when China became a member of the WTO, agricultural production has faced stiff international competition. The situation regarding farmers' incomes has become more complicated.

This chapter discusses farmers' incomes and is organized as follows. In section 2, the development of farmers' incomes since the reforms began will be reviewed. In sections 3 and 4 the development of the Township and Village Enterprises (TVEs) and China's agricultural production after entry to the WTO, which has influenced the development of incomes in rural areas, will be examined. Farmers' incomes in 1999 and 2000 will be analysed in section 5 in detail by using household survey data. Some concluding remarks and policy suggestions will be provided in section 6.

7.2. Development of Farmers' Incomes since the Reforms

Figure 7.1: The Index of Per Capita Annual Net Income for Rural Households (in real terms), 1978-2000 (1978=100.0)



Growth Rate in Each Phase:
1978—1984: 16.5%
1985—1988: 5.7%
1989—1997: 3.9%
1998—2000: 3.4%
Source: SSB, 2001

During 1978—2000, farmers' real net incomes[4] per capita increased by 3.4% per year (SSB, 2001). Farmers' incomes developed over four phases (see Figure 7.1). The first phase was from 1978 to 1984, when farmers' incomes increased very quickly. Farmers' net incomes increased by 16.5% per year, from 133.6 RMB *yuan* to 355.3 RMB *yuan* (at current prices and thereafter). The second phase was from 1985 to 1988, when farmers' incomes increased slightly. A typical farmer's net income was 544.9 RMB *yuan* in 1988. During this period the annual growth rate was 5.7%. The third phase lasted from 1989 to 1997. The annual growth rate of farmers' incomes was 3.9%, slower than the previous two phases. The average net income of the farmer was 2090.1 RMB *yuan* in 1997. In 1989, farmers' incomes decreased slightly by 1.6%, which was the first instance of income decline since the economic reforms.

[4] Net income means the gross income reduced by production costs.

From 1998 the increase in incomes was very slow. The growth rates were 4.3%, 3.8% and 2.1% for 1998, 1999 and 2000 respectively.

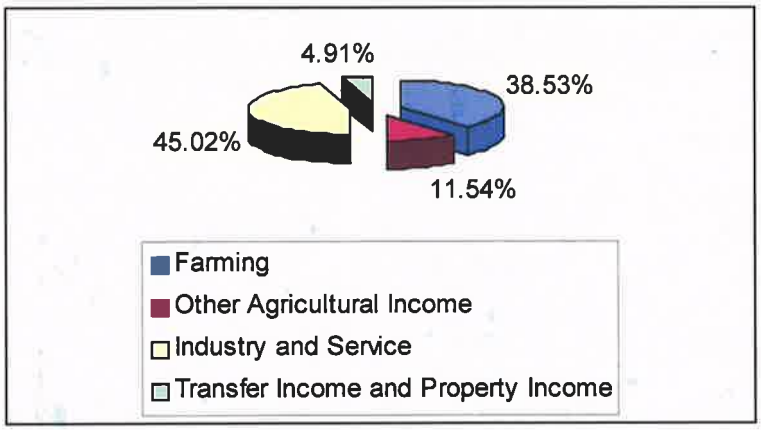
Although farmers' net incomes increased the gap between rural and urban households' net incomes widened further. In 1978 the ratio between average net incomes of rural and urban households was 1:2.57, and in 1984, the ratio narrowed to 1:1.83. Since then the gap has widened further. It was 1:2.17 in 1988 and 1:2.47 in 1997. In 2000, the ratio was 1:2.79, which was even wider than that of 1978. The slow increment in farmers' incomes led to a decline in the consumption market in rural areas and further hampered industrial growth in urban areas.

Within rural society the income disparity has become more pronounced. The Gini coefficient increased from 0.39 in 1995 to 0.43 in 2000 (Guan, Zhang and Guo, 2002). According to the household survey conducted by the Policy Research Office of the Central Committee of the Chinese Communist Party in 2000, the highest income of a rural household was 26,290 RMB *yuan*, consisting of 9.6% of total rural incomes, but accounting for only 1% of the total rural population. Furthermore, the 20% lowest incomes of rural households (accounting for 21.1% of the total rural population) only accounted for 7.6% of total rural incomes (Guan, Zhang and Guo, 2002). The wider gap between rural and urban households' incomes and within rural households only served to increase social instability.

Before 1978 almost all farmers' earnings came from farming, forestry, animal husbandry and fishing, because firstly, grain production was the core of agricultural production and secondly, the secondary and tertiary industries remained underdeveloped in China's rural areas. Since the reforms this situation has changed significantly. In 2000, the per capita farmer's net income was 2253 RMB *yuan*. Income from agriculture was 1136 *yuan* of the net income, of which 868 *yuan* came from farming (SSB, 2001). These accounted for 50.42% and 38.53% of

a farmer's net income respectively. Due to the rapid development of the rural non-agricultural sectors over the past 23 years, TVE wage incomes plus incomes from non-agricultural household business provided 45.02% of farmers' incomes in 2000. This is illustrated in Figure 7.2 below.

Figure 7.2: The Structure of Rural Household Income in 2000



Source: SSB, 2001

There were almost no significant changes in the structure of farmers' incomes in the 4 household survey provinces (Jilin, Jiangxi, Shandong and Sichuan) from 1993 to 2000 (see Table 7.1 below). In 1993 the income from farming accounted for 47.66% of the total income; its share increased slightly to 48.96% in 2000.

Table 7.1: The Structure of Farmers' Incomes per Household in Jilin, Jiangxi, Shandong and Sichuan Provinces in 1993 and 2000 (%)

	1993	2000
In all 4 provinces		
A/Total Income	47.66	48.96
B/Total Income	3.01	1.43
C/Total Income	4.63	5.63
D/Total Income	19.82	15.40
Jilin Province		
A/Total Income	73.84	70.54
B/Total Income	1.54	0.43
C/Total Income	1.19	5.47
D/Total Income	10.45	10.57
Jiangxi Province		
A/Total Income	37.34	45.05
B/Total Income	1.49	1.20
C/Total Income	5.76	8.45
D/Total Income	27.55	19.14
Shandong Province		
A/Total Income	50.20	47.43
B/Total Income	5.59	2.83
C/Total Income	3.71	4.90
D/Total Income	12.69	10.47
Sichuan Province		
A/Total Income	15.01	27.59
B/Total Income	3.37	0.18
C/Total Income	10.38	22.07
D/Total Income	35.99	26.76

Source: Household Survey
Notes:
**A: income from farming;*
B: income from TVE employment;
C: income from repatriation from family members working outside; and
D: income from husbandry.
*** Numbers of observations: Jilin: 200 and 196 in 1993 and 2000 respectively; Jiangxi: 203 and 193 in 1993 and 2000 respectively; Shandong: 209 and 200 in 1993 and 2000 respectively; and Sichuan:197 and 146 in 1993 and 2000 respectively.*

According to the household survey data, the share of farming plus the share of husbandry in total income changed slightly, and there was almost no change in the share of wages from the TVEs and in the repatriation from family members working outside, which accounted for a small proportion of total income. These results meant that there was no change in the structure of income in the grain production areas from 1993 to 2000.

The proportion of farming in the total income of the 4 provinces differed greatly. The share of farming in 2000 was 70.54%, 47.43% 45.05% and 27.59% respectively in Jilin, Shandong, Jiangxi and Sichuan provinces. In the same year the per capita managed land in rural areas was 5.52, 1.45, 1.17 and 1.03 *mu* respectively in Jilin, Shandong, Jiangxi and Sichuan (SSB, 2001). There was a positive relationship between the share of farming in total income and per capita managed land in rural areas. The share of farming in Sichuan's total income was the lowest of the 4 provinces in both years. At the same time, however, the share of repatriation of total income from members working outside Sichuan was 10.38% in 1993 and 22.07% in 2000, which was the highest in four provinces. These results imply that the low land-farmer ratio drove farmers out of their native areas to pursue higher incomes elsewhere.

The growth of agricultural production, the increases in the purchase prices of agricultural products and the development of the TVEs contributed to better incomes for farmers after the reforms were introduced. Since the mid-1990s, however, the development of TVEs has stagnated. Following China's admission into the WTO, local agricultural products faced international competition from cheap products of high quality. Most of China's agricultural products, such as wheat and cotton, lacked a comparative advantage. Scholars and government officials generally agreed on the huge challenges faced by China's agricultural production abroad and the difficulty of increasing farmers' incomes. Hu (2002) pointed out that after the entry into the WTO agricultural production would be very risky, farmers' incomes may even decline in absolute value and the gap between rural and urban residents would widen further. In the 2002 Work Report of the Central Government, by Premier Zhu Rongji, agricultural production and how to increase farmers' incomes would be the government's main concern (*People's Daily*, 2 April 2002).

7.3. The Development of China's Township and Village Enterprises (TVEs)

"Food security" means that people are able to get adequate nutrition to maintain a healthy life and normal activity. It implies that a country or region not only has sufficient food supplies and stable market conditions, but also that all people have access to sufficient food (FAO, 1996). Before the agricultural reforms started in 1978, in order to achieve food security, the main task of agriculture was to produce grain. Most rural workers were engaged in grain production, yet agricultural productivity was very low. The rural reforms enabled China to eliminate a shortage in food supply and productivity grew significantly. An excess labour supply grew in the rural areas.

It could be anticipated that, in an era of rapid technological advances and economic globalization after WTO membership, China would not only be able to feed itself through agricultural development and international trade, but also have a surplus supply of rural labour. The best way to transfer excess labour from agricultural to non-agricultural activities was to employ it in labour-intensive industry, namely, the TVEs[5] (due to the *Hu kou* or Registered Permanent Residence System that stopped farmers migrating freely to the urban areas and from one city to another).

During the collectivist era, to attain self-sufficiency within the rural communes, small-scale enterprises and shops were established and managed by the commune and brigade. These enterprises were mainly engaged in processing agricultural products and by-products, and in providing technical services for agricultural production. The Cultural Revolution provided some opportunities for the "commune and brigade enterprises" (CBEs) to improve production and expand their scope of operations.[6] The chaos that the Cultural Revolution unleashed, however, especially in urban areas, disrupted and even curtailed the productiveness of some state enterprises. Many technicians and skilled workers were sent to the countryside, usually

[5] In China it is always said that employment in TVEs marks the departure of farmers from the land but still living in the village (*li tu bu li xiang*), i.e. being engaged in non-agricultural work in the village.
[6] After the collapse of the commune system, the CBEs were renamed TVEs.

to their original hometowns in nearby regions. Supported by them, CBEs were able to produce some consumer goods that were sold in urban areas.

However, these CBEs were strictly regulated by the government and they could not grow as fast as they desired. This situation changed during the early reform period when the government lifted restrictions on the now famous TVEs.[7] The policy changes in agriculture provided an opportunity for the very rapid development of TVEs, and they have been the main source of China's dynamism (Chen, Jefferson and Singh, 1992; Findlay, Watson and Wu, 1994; McMillan, 1994). The annual growth rate in nominal terms of TVEs' output was more than 29.43% during 1981—1999[8] (see Table 7.2).

The government anticipated that the development of TVEs under favourable policies would result in some benefits being diverted to subsidizing agricultural production. TVEs would also be considered a suitable way to absorb excess agricultural labour, and this would increase farmers' incomes. Given the problems of too much labour in agriculture and restrictions on rural-urban migration, the rate at which TVEs generated employment was critical to the agricultural sector.

From 1978 to 1999 the number of TVEs increased from 1.52 to 20.71 million and in 1994, reached its highest number - 24.94 million. During the same period, the number of employees

[7] Rawski (1994) clarified that collective enterprises (mostly TVEs) are those in which the legal ownership of post-tax profits resides within the enterprise itself. Otherwise the SOEs (State-Owned Enterprises) are enterprises in which residual ownership right resides in the hands of some level of the government. According to *Statistical Yearbook of China* (1988, p. 928), TVEs refer to the industrial enterprises where the means of production and the products are owned by workers. In fact, the ownership of TVEs is controlled and managed by some level of the administration.

[8] Care should be taken when citing statistical data about TVEs because they are full of errors and are usually over-reported. The development strategies, policies, laws, regulations and statistical work of TVEs are managed and operated by the MoA's Bureau of Township and Village Enterprises. When the author was a project official in the MoA, he discussed this issue with officials in the Bureau. They told the author that although the definition of TVEs was stated publicly by the State Statistical Bureau, many different definitions of TVEs are still used in practice due to the lack of knowledge about statistics, especially in the poorer and underdeveloped regions. In some areas only the enterprises that employ at least eight persons and are owned collectively are defined as TVEs. In other areas even a very small shop that is owned by an individual household and only sells candy and flavourings is considered to be a TVE. On the other hand, some rural cadres deliberately over-report the data, especially TVE output, because an "excellent" output number could improve their promotion prospects.

increased from 28.87 to 127.04 million, and in 1996, the number was 135.08 million at its peak (see Table 7.2). The employees of TVEs accounted for just 7.04% of total employment in 1978 and by 1996 this figure was three times that of 1978, indicating that TVEs had indeed absorbed a large amount of excess labour. Taking into account the government policy of allocating preferential credits and inputs that were biased against the TVEs and in favour of State-Owned Enterprises (SOEs), the TVEs' achievement may be described as miraculous.

The rise of the TVEs can be explained mainly by their ability to allocate resources according to market signals rather than government direction, particularly in reflecting the relative scarcity of resources and changes in demand and supply. At first unable to procure low interest loans and subsidies from the government, TVEs had to buy inputs and sell products according to market prices, and had to seek further development through market competition.[9] It was in fact precisely the market signals that reflected the relative scarcity of resources. The "survival of the fittest" motto enabled the TVEs to exploit the economic comparative advantages of relatively abundant and cheap labour resources. Most TVEs were labour-intensive industries, and their products were very competitive not only in the domestic market but also internationally.

TVEs were most highly developed in the coastal provinces, such as Jiangsu, Zhejiang, Shandong, Fujian and Guangdong. These five provinces were and remain the most densely populated in the country. Before the rapid development of the TVEs, the problems these provinces faced with their excess labour supply in agriculture were very serious. However, thanks to their comparative advantages, a considerable number of labour-intensive industries that employed relatively cheap labour sprang up in these provinces. By the early 1990s these provinces were actually short of labour and had to import many labourers from the central

[9] With the development of TVEs, this situation had been reversed. In order to develop the local economy, local government introduced various measures to protect their industries (including TVEs). However, due to the fact that most TVEs are owned and managed by a township or village, the scale and scope of protection is limited.

and western regions. Using comparative advantage in these provinces also brought about a surge in the local economy. That increased local farmers' incomes, created more profit and earned more foreign exchange and thus stimulated the accumulation of capital. The upshot of all these factors was that recently, these provinces have begun to develop capital- and technology-intensive industries and moved a number of labour-intensive ones to the central and western parts of the country.

The TVEs have helped to maintain agricultural production through some direct cross-subsidization (Carter, Zhong and Cai, 1996), provision of technical services and development of infrastructure in the community.[10] However, the TVEs also competed with the agricultural sector for production needs, for example land, labour, fuel, electricity and capital. This had a negative impact on agricultural production.[11] For example, the TVEs usually employed highly skilled and young workers in the village, leading to a decline in the quality of human capital in farming and other agricultural activities. They also created serious pollution problems for agricultural land and water due to the lack of suitable technologies and facilities (Findlay, Watson and Wu, 1994).

Until now, the TVEs have been regarded as another way to industrialize and urbanize, and their main task was to transfer labour from agriculture to heavy industry, instead of being a way to increase farmers' incomes. After their rapid development in the early 1980s and 1990s, the TVEs slowed down by the latter part of the 1990s, and so did their absorption of labour (see Table 7.2). TVE employment reached a peak of 135.08 million in 1996, dropping in 1997 and 1998, and then slightly recovering to 127.04 million in 1999. The prospect of further TVE development was not optimistic. At the same time a large number of urban

[10] Prior to reform, the infrastructure facilities, such as reservoirs, were owned and operated collectively. Since the reform, these facilities were distributed on the basis of the household. For example, the reservoir was turned into fishponds. The farmers did not have enough investment to maintain those facilities. Given this situation, the TVEs could provide some maintenance to the infrastructure because the TVEs are owned collectively.

[11] In some areas, this certainly is part of the adjustment process of the production structure in rural areas.

workers in the state-owned enterprises (SOEs) were laid off.[12] From 1996 to 2000 employment in SOEs declined by at least 30 million (Wang, 2002). It is estimated that by 2008, due to reforms in SOEs, the annual average unemployment of SOEs will be at least 10 million (interview with Du Ying, University of Adelaide, November 2000). Most laid-off workers from the SOEs were employed by the TVEs. Compared to rural labour, workers who were laid off by SOEs were more skilled, educated and trained, and would rather be employed by the TVEs. Taking into account the combination of reformed SOEs and only slowly developing TVEs, the latter's absorption of rural labour will decline even further.

Wang (2002) predicted that in 2010 even if TVE employment reached 149 million at an annual growth rate of 1.5%, the rural labour force would reach 530 million at an annual rate of 0.2%; the rural –urban migration would be at 77 million, and there would still be 304 million labourers in agriculture. Hu (2002) estimated that with the current technology and land and demand for agricultural products, the optimal amount of rural labour in agricultural production is approximately 150 to 200 million. The problems of excess labour in agricultural production are still very serious. Excess rural labourers still have to find some work in agriculture.

[12] China's total number of unemployed workers as declared by the government may be lower than the official estimate. In many situations, the officials would rather use the definition of "leaving the working position (*xia gang*)". The worker who left the working position would receive a varied monthly living allowance depending on the different regions from the government or original enterprises. The officials would not regard them as unemployed.

Table 7.2: The Number, Employment and Output of TVEs, 1978-1999

Year	Number of TVEs* (million)	Employees of TVEs* (million persons)	Share of Employees in TVEs in Total Employment *** (%)	Output of TVEs **(Billion RMB *yuan*)
1978	1.52	28.27	7.04	49.51
1979	1.48	29.09	7.09	55.23
1980	1.42	30.00	7.08	66.51
1981	1.34	29.70	6.79	73.67
1982	1.36	31.13	6.87	84.63
1983	1.35	32.35	6.97	100.79
1984	6.07	52.08	10.81	169.78
1985	12.22	69.79	13.99	275.50
1986	15.15	79.37	15.48	358.33
1987	17.50	88.05	16.68	494.77
1988	18.88	95.45	17.57	701.78
1989	18.69	93.67	16.93	840.18
1990	18.50	92.65	14.50	958.11
1991	19.08	96.09	14.83	1162.17
1992	20.79	105.81	16.14	1765.97
1993	24.53	123.45	18.60	3117.69
1994	24.94	120.17	17.88	4537.85
1995	22.03	128.62	18.93	6891.52
1996	23.36	135.08	19.62	n.a.
1997	20.15	130.50	18.75	8990.06
1998	20.04	125.37	17.92	9669.37
1999	20.71	127.04	17.80	10842.61
Annual Growth Rate				
1978—1999	23.83	8.23	--	29.43

*Source: * SSB, Rural Statistical Yearbook of China, various issues*

*** SSB, Statistical Yearbook of Township and Village Enterprises of China, various issues*

**** Calculated by the author*

Notes: In the China Statistical Yearbook of Township and Village Enterprises, some traditional statistical measures were employed. As for TVE output, the cost was not deducted from the output so the output values are sometimes more than those of GDP.

7.4. Agricultural Production after WTO Admission

After a long period of negotiation, China entered the WTO and membership would prove to have a strong impact on agricultural production and farmers' incomes. It was negotiated that China would accept a tariff quota for grain imports at a 1% token tariff rate. In 2002 the quota was 18.308 million tons, of which wheat constituted 8.468 million tons, equal to 8.5% of domestic production and about 22% of the traded amount. Corn was 5.85 million tons, equal

to 5.5% of domestic production and about 10% of the traded amount. Rice amounted to 3.99 million tons, equal to 3% of domestic production and 11% of the traded amount. Importing grain from the international market would have a negative impact on domestic grain production.

Since 1998, grain production increased gradually but did not reach its potential production level due to a decline in the grain purchase price and a series of good harvests that produced surplus grain in rural households and the state grain enterprises. In 2001, grain production reached 452.62 million tons (Hu, 2002), which was 59.68 million tons less than that of 1998. Rice production decreased by 6.4%, from 200.74 in 1997 to 187.91 million tons in 2000. Wheat production declined by 19.2%, from 123.29 in 1997 to 99.64 million tons in 2000. Corn production decreased by 20.3%, from 132.95 in 1998 to 106.00 million tons in 2000.

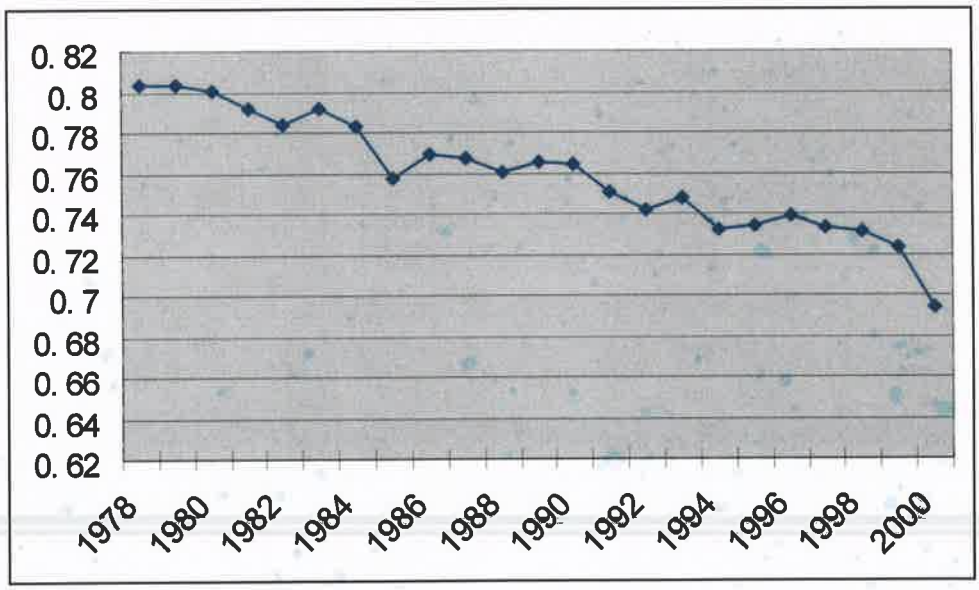
Zhong (1999) pointed out that China had no comparative advantage in wheat and corn, but has it in rice and cash crops, such as fruit, tobacco, silkworm cocoon and soybean. After being admitted to the WTO, Hu (2002) predicted that the southern regions that always bought grain from the northern regions would increase grain imports, especially corn, from the international market and reduce imports from the northern regions. The import of corn and wheat would increase because there would be no comparative advantage in their production, therefore their production would decline further. Hu (2002) also predicted that importing grain would increase and grain production would decrease further, and the annual output of grain would be between 400.00 and 420.00 million tons. The self-sufficiency rate of grain would fall to 90—92%.

On the other hand WTO membership also provided opportunities for China's agriculture to develop. There was some potential to export products with a comparative advantage. In the later 1980s China had the largest agriculture-based economy in the world, but the export of

agricultural products was relatively small. For example, in 1999 the output of peanuts was 14.437 million tons, accounting for 38.2% of the world's output but the export volume was only about 0.4 million tons. In 1999, the export of soybean was 0.21 million tons, accounting for 1.0% of its output; the export of aquatic products was 1.2 million tons, accounting for 2.8% of its output; and the export of pig meat was 2.03 million tons, accounting for 0.38% of its output. Only the export of tea took a higher proportion of its output (33.3%).

Prior to the agricultural reforms, grain production was targeted by the government as the most important agricultural activity because China had to feed itself. Following the reforms, grain production and self-sufficiency were still regarded as the major task by using centralised planning which distorted market mechanisms. The issue of farmers' incomes was regarded as the second problem to be fixed. Grain production was a land-intensive activity and this is seen in Figure 7.3. While the share of grain sown area in total sown area declined gradually, about 70% of total sown area was still used for grain production. The gradual decline in the share of grain sown area of the total sown area implied that with higher grain production the production structure could change accordingly.

Figure 7.3: The Share of Grain Sown Area in the Total Sown Area, 1978 to 2000



Source: SSB, 2001

Anderson, Huang and Ianchovichina (2002) noted that after China's entry to the WTO, while farm/non-farm and Western-Eastern income inequality might well rise, rural-urban income inequality need not rise. This can be shown by using the global economy-wide numerical simulation model (GTAP) to study the impact of China's WTO membership on rural-urban income inequality. Even if the prices of some (land-intensive) agricultural products fell, other (labour-intensive) agricultural products could become more exportable. The removal of restrictions on exports of textiles and clothing (also labour-intensive) would also boost TVEs, so demand for non-farm workers in rural areas may grow even if aggregate demand for rural labour falls. Furthermore, in rural areas, because of the growth in unskilled workers' wages in non-farm activities, rural non-farm poverty would fall. On the other hand, in hinterland provinces where the necessary infrastructure was lacking, investment in expanding and labour-intensive activities as textiles and clothing would not occur, thereby increasing poverty.

WTO membership not only challenged China's current agricultural production but also provided some opportunities for further reform of the agricultural production structure. The central government should implement various measures to change the structure of agricultural production, and to encourage the creation of some agricultural products in which China has a comparative advantage and to provide higher incomes for farmers.

7.5. Analysis of Farmers' Incomes in 1999 and 2000 in 5 Household Surveyed Provinces: the Empirical Evidence

In 1978 China's farmers' average net income was only 133.6 RMB *yuan*, and the net income was 2253 RMB *yuan* in 2000. The Household Responsibility System, rising purchase price and the development of TVEs contributed to this increase. However, from 1997 onward, the increase in farmers' incomes was very small. The net income in real terms increased only by 4.6%, 4.3%, 3.8% and 2.1% in 1997, 1998, 1999 and 2000 respectively (Han, 2001). The main causes for this low rate of increase in farmers' incomes included: the contribution rate

of income from agriculture declining due to a corresponding fall in grain's purchase price; and decreasing demand for grain (because in most areas the income from the sale of grain was still the main source of farmers' incomes). On the other hand, repatriation from family members working outside became the main source of income growth.

In order to study the current structure of income in rural areas, household survey data will be used to analyse farmers' incomes in detail. The household survey was conducted in Henan, Shangdong, Jiangxi, Jilin and Sichuan provinces. All the data was collected from the grain producing areas in these five provinces. Therefore the main source of income in these five provinces should be from agriculture, especially farming. Table 7.3 illustrates the share of income from farming in these five provinces as being 52.03% in 1999 and 50.59% in 2000. Tables 7.4 to 7.8 illustrate the share of income from farming out of the total income as being 50.21%, 47.20%, 50.55%, 70.42% and 31.68% in 1999 respectively. The total farming incomes for Henan, Shangdong, Jiangxi, Jilin and Sichuan provinces in 2000 were 47.29%, 47.35%, 45.05%, 70.56% and 27.59% respectively.

Table 7.3: Average Income per Household in 1999 and 2000 for the Five Provinces

	Income in 1999	Income in 2000	Difference between 1999 and 2000	Change (%)
Volume (RMB *yuan*)				
Farming	4570.89	4526.55	-44.34	-0.97
Forestry	0.35	44.2	-36.15	-44.99
Husbandry	351.08	547.61	196.53	55.98
Fishery	80.04	89.06	9.02	11.27
Industry	332.3	336.72	4.42	1.33
Construction	352.12	289.55	-62.57	-17.77
Transport	335.11	325.54	-9.57	-2.86
Commerce	237.28	226.64	-10.64	-4.48
Other Services	624.99	671.1	46.11	7.38
Wages from TVEs	218.22	172.72	-45.5	-20.85
Collective Distribution	88.44	111.39	22.95	25.95
Collective Subsidies	413.28	419.46	6.18	1.5
Repatriation from Members Working Outside	724.32	839.68	115.36	15.93
Interest Earnings	26.7	36.16	9.46	35.53
Other Earnings	350.34	311.85	-38.49	-10.99
Total	8785.46	8948.23	162.77	1.85
Share	%	%		
Farming	52.03	50.59	-1.44	--
Forestry	0.91	0.49	-0.42	--
Husbandry	4.00	6.12	2.12	--
Fishery	0.91	1.00	0.09	--
Industry	3.78	3.76	-0.02	--
Construction	4.01	3.24	-0.77	--
Transport	3.81	3.64	-0.17	--
Commerce	2.70	2.53	-0.17	--
Other Services	7.11	7.50	0.39	--
Wages from TVEs	2.48	1.93	-0.55	--
Collective Distribution	1.01	1.24	0.23	--
Collective Subsidies	4.70	4.69	-0.01	--
Repatriation from Members Working Outside	8.24	9.38	1.14	--
Interest Earnings	0.30	0.40	0.1	--
Other Earnings	3.99	3.49	-0.5	--
Total	100	100	0	--

Source: Household Survey; number of observations: 932.

From Table 7.3 we can see that in 2000 the total income per household increased slightly in the five provinces. The increase was 162.77 RMB *yuan,* and the change was only 1.85%.[13]

[13] This rate does not take into account that the price changes and the increasing value were in nominal terms. According to SSB, 2001, the general retail price index decreased at a rate of 1.5% in 2000, compared to that of 1999. Considering the changes in prices in 1999, the increasing value and rate should be larger.

The main reasons for this increase were from the increase in incomes from husbandry and repatriation from members working outside. The value of increases from husbandry and repatriation was 196.53 RMB *yuan* and 115.36 RMB *yuan,* the rates of increase were 55.98% and 15.93% respectively. The average incomes from husbandry and repatriation from members working outside were 547.61 RMB *yuan* and 839.68 RMB *yuan,* which accounted for 6.12% and 9.38% respectively of the total income in these five provinces; and the rates of increase were 55.98% and 15.93% respectively. Conversely, during the same period incomes from farming decreased slightly by 0.97%. The empirical evidence in these five provinces coincides with the general situation in China's rural areas.

In Henan province during 2000 the average income per household increased by 11.26%, or 1047.65 RMB *yuan.* Table 7.4 shows that the income from husbandry, family business and farming were the sources of rising incomes. These increases were 821.26 RMB *yuan,* 263.3 RMB *yuan* and 223.45 RMB *yuan* respectively. Of all five provinces, only in Henan, did income from repatriation of members working outside decrease in 2000 at 5.63%; this decline was 26.77 RMB *yuan.*

Shandong province was the richest of all five provinces, and average income per household was 12130.79 RMB yuan in 1999 and 12237.71 RMB *yuan* in 2000. Table 7.5 shows that in Shangdong in 2000, income per household increased by only 0.88%. Incomes from farming increased slightly by only 1.37%. Of the five provinces only in Shandong did TVE wages increase in 2000 - by 15.72%. The share of income from TVE wages in the total income increased from 2.46% in 1999 to 2.83% in 2000. At the same time, the income from repatriation from members working outside increased greatly by 26.02% at 123.8 RMB *yuan,* and income from other services in family businesses increased by 8.16%. At the same time income from husbandry in Shangdong decreased slightly - by 0.69%.

In Jiangxi province in 2000 (see Table 7.6), the average income per household decreased slightly by –0.4%. The income from farming also decreased slightly by -1.24%. On the other hand, the income from husbandry and repatriation from members working outside increased by 19.11% and 12.67% respectively.

In Jilin province in 2000 (see Table 7.7), the average income per household decreased by 7.44%. Incomes from both farming and husbandry decreased, by 7.26% and 19.51% respectively in all five provinces. Only in Jilin and Shandong (-0.69%) did incomes from husbandry decrease. But the incomes from repatriation from members working outside increased at a rate of about seven times.

Of the five provinces, Sichuan was the poorest and in 1999 and 2000, the average income per household was only 8338.36 and 7441.54 RMB *yuan* respectively (see Table 7.8). In 2000, the income per household in Sichuan decreased the most significantly among all five provinces - by 10.76%. The share of income from farming in the total income in Sichuan was the lowest, only 31.68% and 27.59% in 1999 and 2000 respectively. However, it was still the first source of farmers' incomes. The income from farming also had the fastest decline of the five provinces (by 22.27%) in 2000. Also, incomes from family businesses in industry and construction decreased, by 75.91% and 39.23% respectively. On the other hand the income from repatriation from members working outside increased dramatically by 40.35%. Of all the provinces the share of income from the repatriation of members working outside were 14.03% and 22.07% in 1999 and 2000 respectively, i.e. it was the highest.[14]

In Tables 7.4 to 7.8 it can be seen that even though the household survey data was collected in grain producing areas in these five provinces, income from husbandry in 2000 took a great

[14] Due to high population density, people tend to leave Sichuan to find job opportunities elsewhere. They even go to Guizhou province, which is the poorest area in China, to find work. Most people are engaged in providing services, especially restaurants. Now, Sichuan restaurants have spread all over China, even to other countries.

proportion of total income (23.08%, 10.47%, 19.14%, 10.57% and 26.76% in Henan, Shangdong, Jilin, Jiangxi and Sichuan, respectively). As discussed in an earlier section, there were too many labourers in China's rural areas, so many farmers had to go to urban areas to seek higher incomes. In these five provinces the proportion of income in total income in 2000 from repatriation from family members working outside increased from 5.11%, 3.92%, 7.47%, 0.64% and 14.03% in 1999 to 4.33%, 4.90%, 8.44%, 5.48% and 22.07% respectively in Henan, Shangdong, Jilin, Jiangxi and Sichuan provinces.

In Tables 7.4 to 7.8 we can also see that in 2000 the farmers' income per household in Henan province increased by 11.26%. In Shangdong and Jiangxi the changes in farmers' incomes were very slight, 0.88% and –0.4% respectively. But in Jilin and Sichuan the farmers' incomes decreased at huge rates of -7.44% and -10.76% respectively. Income from farming increased in Henan (4.78%) and Shandong (1.37%) but declined in Jiangxi (-11.24%), Jilin (-7.26) and Sichuan (-22.27%) provinces from 1999 to 2000. The percentage between the change in the amount of income from farming and the total change were 21.33%, 73.19%, 1408.29%, 68.73% and 65.59% in Henan, Shandong, Jiangxi, Jilin and Sichuan respectively. These results mean that the change in grain purchasing price would still have a strong impact on farmers' incomes in the near future.

Table 7.4: Average Income per Household in 1999and 2000, Henan Province

	Income in 1999	Income in 2000	Difference between 1999 and 2000	Change (%)
Volume (RMB *yuan*)				
Farming	4673.55	4897	223.45	4.78
Forestry	66.2	37.66	-28.54	-43.11
Husbandry	1569.19	2390.45	821.26	52.34
Fishery	0	0	0	0
Industry	290	553.3	263.3	90.79
Construction	106.5	136.5	30	28.17
Transport	380.75	383.25	2.5	0.66
Commerce	158	161.47	3.47	2.2
Other Services	508.5	552.74	44.24	8.7
Wages from TVEs	256.15	161.12	-95.03	-37.1
Collective Distribution	126.44	149.38	22.94	18.14
Collective Subsidies	399.86	313.08	-86.78	-21.7
Repatriation from Members Working Outside	475.5	448.73	-26.77	-5.63
Interest Earnings	12.8	8.12	-4.68	-36.56
Other Earnings	284.65	162.94	-121.71	-42.76
Total	9308.09	10355.74	1047.65	11.26
Share	%	%		
Farming	50.21	47.29	-2.92	--
Forestry	0.71	0.36	-0.35	--
Husbandry	16.86	23.08	6.22	--
Fishery	0	0	0	--
Industry	3.12	5.34	2.22	--
Construction	1.14	1.32	0.18	--
Transport	4.09	3.70	-0.39	--
Commerce	1.70	1.56	-0.14	--
Other Services	5.46	5.34	-0.12	--
Wages from TVEs	2.75	1.56	-1.19	--
Collective Distribution	1.36	1.44	0.08	--
Collective Subsidies	4.30	3.02	-1.28	--
Repatriation from Members Working Outside	5.11	4.33	-0.78	--
Interest Earnings	0.14	0.08	-0.06	--
Other Earnings	3.06	1.57	-1.49	--
Total	100	100	0	--

Source: Household Survey; number of observations: 197.

Table 7.5: Average Income per Household in 1999 and 2000, Shandong Province

	Income in 1999	Income in 2000	Difference between 1999 and 2000	Change (%)
Volume (RMB *yuan*)				
Farming	5725.78	5804.04	78.26	1.37
Forestry	109.95	23.5	-86.45	-78.63
Husbandry	1290.62	1281.68	-8.94	-0.69
Fishery	84.83	96	11.17	13.17
Industry	491.84	513.65	21.81	4.43
Construction	476.62	404.8	-71.82	-15.07
Transport	483.58	425	-58.58	-12.11
Commerce	318.91	290	-28.91	-9.07
Other Services	943.13	1020.05	76.92	8.16
Wages from TVEs	299	346	47	15.72
Collective Distribution	55.72	56.75	1.03	1.85
Collective Subsidies	722.28	711.45	-10.83	-1.5
Repatriation from Members Working Outside	475.71	599.51	123.8	26.02
Interest Earnings	87.88	91.56	3.68	4.19
Other Earnings	564.94	573.72	8.78	1.55
Total	12130.79	12237.71	106.92	0.88
Share	%	%		
Farming	47.20	47.43	0.23	--
Forestry	0.91	0.19	-0.72	--
Husbandry	10.64	10.47	-0.17	--
Fishery	0.70	0.79	0.09	--
Industry	4.05	4.20	0.15	--
Construction	3.93	3.31	-0.62	--
Transport	3.99	3.47	-0.52	--
Commerce	2.63	2.37	-0.26	--
Other Services	7.77	8.34	0.57	--
Wages from TVEs	2.46	2.83	0.37	--
Collective Distribution	0.46	0.46	0	--
Collective Subsidies	5.95	5.81	-0.14	--
Repatriation from Members Working Outside	3.92	4.90	0.98	--
Interest Earnings	0.72	0.75	0.03	--
Other Earnings	4.66	4.69	0.03	--
Total	100	100	0	--

Source: Household Survey; number of observation: 200.

Table 7.6: Average Income per Household in 1999 and 2000, Jiangxi Province

	Income in 1999	Income in 2000	Difference between 1999 and 2000	Change (%)
Volume (RMB *yuan*)				
Farming	5290.78	4695.92	-594.86	-11.24
Forestry	0	0	0	0
Husbandry	1674.94	1995.04	320.1	19.11
Fishery	197.26	224.04	26.78	13.58
Industry	192.05	124.35	-67.7	-35.25
Construction	239.19	280.1	40.91	17.1
Transport	384.05	360.1	-23.95	-6.24
Commerce	158.92	220.2	61.28	38.56
Other Services	448.97	527.46	78.49	17.48
Wages from TVEs	261.03	125.28	-135.75	-52.01
Collective Distribution	177.26	213.49	36.23	20.44
Collective Subsidies	405.95	465.95	60	14.78
Repatriation from Members Working Outside	781.35	880.31	98.96	12.67
Interest Earnings	28.54	34.46	5.92	20.74
Other Earnings	226.27	277.62	51.35	22.69
Total	10466.56	10424.32	-42.24	-0.4
Share	%	%		
Farming	50.55	45.05	-5.5	--
Forestry	0	0	0	--
Husbandry	16.00	19.14	3.14	--
Fishery	1.88	2.15	0.27	--
Industry	1.83	1.19	-0.64	--
Construction	2.29	2.69	0.4	--
Transport	3.67	3.45	-0.22	--
Commerce	1.52	2.11	0.59	--
Other Services	4.29	5.06	0.77	--
Wages from TVEs	2.49	1.20	-1.29	--
Collective Distribution	1.69	2.05	0.36	--
Collective Subsidies	3.88	4.47	0.59	--
Repatriation from Members Working Outside	7.47	8.44	0.97	--
Interest Earnings	0.27	0.33	0.06	--
Other Earnings	2.16	2.66	0.5	--
Total	100	100	0	--

Source: Household Survey; number of observations: 193.

Table 7.7: Average Income per Household in 1999and 2000, Jilin Province

	Income in 1999	Income in 2000	Difference between 1999 and 2000	Change (%)
Volume (RMB *yuan*)				
Farming	6272.74	5817.27	-455.47	-7.26
Forestry	0	0	0	0
Husbandry	1082.84	871.61	-211.23	-19.51
Fishery	0	0	0	0
Industry	0	0	0	0
Construction	100.51	145.92	45.41	45.18
Transport	73.23	134.69	61.46	83.93
Commerce	65.15	84.18	19.03	29.21
Other Services	297.07	178.57	-118.5	-39.89
Wages from TVEs	36.87	35.71	-1.16	-3.15
Collective Distribution	43.43	160.56	117.13	269.7
Collective Subsidies	392.17	179.08	-213.09	-54.34
Repatriation from Members Working Outside	56.57	451.53	394.96	698.18
Interest Earnings	96.3	38.21	-58.09	-60.32
Other Earnings	390.3	147.19	-243.11	-62.29
Total	8907.18	8244.52	-662.66	-7.44
Share	%	%		
Farming	70.42	70.56	0.14	--
Forestry	0	0	0	--
Husbandry	12.16	10.57	-1.59	--
Fishery	0	0	0	--
Industry	0	0	0	--
Construction	1.13	1.77	0.64	--
Transport	0.82	1.63	0.81	--
Commerce	0.73	1.02	0.29	--
Other Services	3.34	2.17	-1.17	--
Wages from TVEs	0.41	0.43	0.02	--
Collective Distribution	0.49	1.95	1.46	--
Collective Subsidies	4.40	2.17	-2.23	--
Repatriation from Members Working Outside	0.64	5.48	4.84	--
Interest Earnings	1.08	0.46	-0.62	--
Other Earnings	4.38	1.79	-2.59	--
Total	100	100	0	--

Source: Household Survey; number of observations: 196.

Table 7.8: Average Income per Household in 1999 and 2000, Sichuan Province

	Income in 1999	Income in 2000	Difference between 1999 and 2000	Change (%)
Volume (RMB *yuan*)				
Farming	2641.59	2053.37	-588.22	-22.27
Forestry	88.59	139.82	51.23	57.83
Husbandry	1969.17	1991.39	22.22	1.13
Fishery	46.85	21.3	-25.55	-54.54
Industry	344	82.88	-261.12	-75.91
Construction	577.1	350.68	-226.42	-39.23
Transport	95	65.75	-29.25	-30.79
Commerce	307	236.3	-70.7	-23.03
Other Services	584.57	542.68	-41.89	-7.17
Wages from TVEs	59.5	13.7	-45.8	-76.97
Collective Distribution	0	0	0	0
Collective Subsidies	122.93	101.54	-21.39	-17.4
Repatriation from Members Working Outside	1170.25	1642.47	472.22	40.35
Interest Earnings	16.7	0.34	-16.36	-97.96
Other Earnings	315.11	199.32	-115.79	-36.75
Total	8338.36	7441.54	-896.82	-10.76
Share	%	%		
Farming	31.68	27.59	-4.09	--
Forestry	1.06	1.88	0.82	--
Husbandry	23.62	26.76	3.14	--
Fishery	0.56	0.29	-0.27	--
Industry	4.13	1.11	-3.02	--
Construction	6.92	4.71	-2.21	--
Transport	1.14	0.88	-0.26	--
Commerce	3.68	3.18	-0.5	--
Other Services	7.01	7.29	0.28	--
Wages from TVEs	0.71	0.18	-0.53	--
Collective Distribution	0	0	0	--
Collective Subsidies	1.47	1.36	-0.11	--
Repatriation from Members Working Outside	14.03	22.07	8.04	--
Interest Earnings	0.20	0.01	-0.19	--
Other Earnings	3.78	2.68	-1.1	--
Total	100	100	0	--

Source: Household Survey; number of observation: 146.

7.6. Conclusion

Now and in the near future, farming will still provide most of farmers' incomes in many poor and inland provinces. In 2000, agricultural production was 463 million tons, representing a decrease of 45 million tons compared to 1999. Due to a series of good harvests, however, the supply of grain still exceeded the demand for grain. In Table 7.9 it can be seen that in terms of demand for grain, although China's total grain consumption showed a rate of annual increase of 2%, grain storage still increased. Therefore, a continuous surplus has been the main feature of China's grain market since the mid-1990s. The increase in total grain consumption has been mainly attributed to more grain consumption for food and industrial use. Table 7.10 reflects the structural changes in food consumption of China's urban and rural residents due to rising per capita incomes. In 2000, the Engle coefficients for Chinese urban and rural residents were 39.2% and 50.1% respectively (Wang, 2001).

For China's urban residents from 1990-2000, annual direct grain consumption per capita decreased from 130.7kg to 82.3kg, a decline of 37.2%; annual pork consumption per capita decreased from 18.5kg to 16.7kg, a fall of 10.8%. During the same period, for rural residents, annual direct consumption of grain per capita also declined. In contrast, urban and rural residents' per capita consumption of poultry, eggs, egg products and aquatic products increased significantly. Because poultry, eggs, egg products and aquatic products had a higher conversion ratio of feed to meat, the growth rate of demand for indirect grain consumption will also slow down in the future.

In Table 7.11 we can see that in 2000 - compared to 1999 - the purchase prices of the major grains in China decreased except for that of soybean, which increased by only 4.4%. At the same time, the sales prices of the grains all decreased greatly by 17.7%, 21.24%, 20.4%, 17.2% and 21.1% respectively for white wheat, early Indica rice, late Indica rice, Japonica

rice and corn, and only the soybean price decreased slightly by 4.4%. We learn from Table 7.9 that although in 2000 the grain stock decreased by 33.80 million tons, incomes from farming all over China also decreased due to the falling prices of purchases and sales. From Table 7.3 we can surmise that incomes from farming changed in these five provinces only slightly, due to the whole macro-economic situation. On the other hand, in 2000 incomes from husbandry increased quickly, and became the main factor of income increase per household. Urban and rural residents' consumption of husbandry products increased (see Table 7.10) so that farmers' incomes from husbandry increased.

Table7.9: China's Grain Balance, 1996-2000 (million tons)

Year	1996	1997	1998	1999	2000
Total Supply	516.54	501.22	519.83	516.10	476.07
Production	504.54	494.17	512.30	508.39	462.50
Import	12.00	7.05	7.08	7.71	13.57
Total Demand	468.06	478.32	489.12	495.26	509.87
Food	269.26	269.50	270.84	271.96	273.05
Feed	127.23	129.85	135.04	139.10	144.66
Seed	11.52	11.52	11.37	10.67	10.63
Industrial Use	32.79	33.79	36.83	40.15	43.76
Loss	25.83	25.06	25.07	25.81	23.78
Export	1.44	8.59	9.06	7.58	14.00
Year-End Stock Change	48.48	22.90	30.26	20.84	-33.80

Source: Information Centre, Ministry of Agriculture

Due to deflation in 2000 (according to SSB, 2001, the general retail price index decreased at a rate of 1.5% in 2000, compared to 1999), the development of TVEs also slowed down. Therefore TVEs' absorption of labour decreased. In 2000, the total number of labourers employed by them was 129 million, which represented an increase over that of 1999 but was far less than that in 1996 (Han, 2001). According to the household survey, in four out of the five provinces surveyed (excluding Shandong), wages from rural enterprises decreased compared to wages in 1999. In contrast, at the same time, the income from repatriation from members working outside increased, and became the main source of income growth in 2000.

Table 7.10: Changes in Food Consumption of Urban and Rural Residents in China (kg/person per year)

	Urban Residents		Rural Residents	
	1990	2000	1990	2000
Grain	130.7	82.3	262.1	249.5
Pork	18.5	16.7	11.3	14.4
Beef and Lamb	3.3	3.3	n.a.	n.a.
Poultry	3.4	7.4	1.3	2.8
Eggs and Egg Products	7.25	11.9	2.4	4.8
Aquatic Products	7.69	11.7	2.1	3.9

Source: Information Centre, Ministry of Agriculture

Table 7.11: The Purchase and Sale Prices of Major Grains in China, 2000 (per 50 kg)

	Purchasing Price (yuan)	Compared to 1999 (%)	Sale Price (yuan)	Compared to 1999 (%)
White Wheat (Grade 3)	57.39	-11.4	59.83	-17.7
Early Indica Rice (Grade 3)	47.29	-13	50.76	-21.24
Late Indica Rice (Grade 3)	53.19	-14.6	56.6	-20.4
Japonica Rice (Grade 3)	60.2	-11.3	62.26	-17.2
Corn (Grade 2)	42.01	-17	44.96	-21.1
Soybean (Grade 3)	90.13	4.4	109.91	-4.4

Source: Han, 2001

Taking into account the current situation of grain production and storage, the development of TVEs and SOEs and the challenges and opportunities following granting of WTO membership, in the near future the main source for farmers' incomes will still come from rural activities. The central government should stabilize and only gradually increase grain purchasing prices because most farmers' incomes in the inland provinces still derive from grain production. Yet the central government should further reform the grain marketing system and ensure that market forces determine production. At the same time, the government should implement some measures to change the structure of agricultural production in rural areas, and increase investment in rural infrastructure. Finally, now because China is in the WTO, it has the opportunity to participate in new rounds of multilateral trade negotiations,

whereby it can seek to increase market access for its exported agricultural products (especially labour-intensive ones). Martin (2002) points out that exports of China's agricultural products face particularly high barriers internationally, and after entry into the WTO membership might improve China's chances of expanding its agricultural markets (although in practice this may be difficult to secure).

CHAPTER 8

CONCLUDING REMARKS

8.1 Conclusion

Although China's economy has grown at a tremendous rate since the economic reform and open-door policies began in the late 1970s, China will continue to be a developing country for a long time. This is because its rural population accounts for more than two thirds of the total population and its per capita income remains less than 10% of people in countries such as the United States and Japan. Although China's economic reform began in the agricultural sector, the recent high growth rates have taken place in the industrial and other sectors and affected agricultural production little. Since the mid-1980s, furthermore, some reforms in the agricultural sector, such as the grain marketing system, have been unsuccessful. Compared to urban people, farmers benefited less from the reforms, and the gap between rural and urban residents' incomes has widened and this trend will worsen. Social stability is being jeopardized and the costs of future economic reform will increase.

The communal agricultural system after the founding of the PRC in 1949 was established by the Communist Party so that a heavy industry-oriented development strategy could be used to establish a modern and industrial country. Priority was given to the development of a capital-intensive, heavy industry in a capital-scarce economy where most of the people were peasants and agriculture was the main activity. It was imperative to artificially underprice capital, energy, raw materials, labour and food in order to lower the threshold of capital accumulation for heavy industry. The institutional arrangements that distorted the prices of production factors and products led to an economy where things were in short supply.

In order to channel scarce resources into heavy industry, which was the goal of the development strategy, centralized plans were made and an administrative resource-allocation mechanism was established. To guarantee control of the surplus produced by the peasants, specific micro-management institutions were formed through the establishment of people's communes. In this price-distorting macro-policy environment, profits ceased to be an indicator of an industry's efficiency. Furthermore, there was no suitable substitute for profit as an indicator of economic operation and management. In order to accumulate capital from the agricultural sector and prevent peasants and rural cadres from embezzling profits, the peasants and communes were deprived of their autonomy. A monopolistic-monopsonistic procurement and marketing system for most agricultural outputs and inputs was established, and sown area plans and the goal of regional grain self-sufficiency were implemented. The choice of a heavy industry strategy resulted in the combination of a price-distorting macro-policy environment, a planned resource-allocation mechanism and a micro-economic management institution lacking autonomy. These three institutional arrangements constituted an organic whole and were inseparable. Within this system the task left for peasants was to provide food, raw materials and capital for China's industrialization at the cost of their incomes and ability to grow food. Generally, before the economic reforms of the late 1970s, farmers made many sacrifices to support the development of heavy industry and increase urban residents' incomes.

The communal/collective agricultural system was established by the Communist Party to facilitate the development of heavy industry and have China catch up with or overtake developed countries. However, the micro-management institution, i.e. the commune system lacked autonomy and this meant that there was not much incentive to work. The resource-allocation mechanism, i.e. the goal of regional self-sufficiency in grains and sown area plans, which relied on market forces, resulted in inefficient allocation of resources. The price distorting macro-policy environment, i.e. the procurement and marketing system for most

agricultural outputs and inputs, led to a distorted economic structure. Therefore, instead of catching up with or overtaking developed countries, China experienced slow economic growth in heavy industry and agriculture. The living standards of most farmers and urban residents were too low to barely survive before the economic reforms in agriculture were introduced in the late 1970s.

China's economic reforms in the agricultural sector began with the delegation of autonomy and the sharing of profits with micro-management units, i.e. the household. These reforms helped to improve incentive and raised productivity. The Household Responsibility System (HRS) that was gradually implemented in rural areas throughout China and rising grain purchase prices improved farmers' incentives, and through the development of Township and Village Enterprises (TVEs), created new avenues of income that were channelled into the agricultural sector. One of the side effects of the CCP's development strategy was the suppression of labour-intensive industry, in which China enjoyed a comparative advantage. Since the reforms both the improvement of incentives caused by using the HRS and the increase in grain purchase prices has boosted growth in the agricultural sector. It has maintained an average annual growth rate of about 8.0% in gross value from 1978 to 1984.

After the farmers had acquired the right to dispose part of their newly created output under the HRS, they demanded a corresponding channel other than the planned allocation mechanism to keep some resources under their control. At the same time, in order to reduce its budgetary outlay on grain subsidies, the central government in 1984 wanted to reform the grain procurement and marketing system. However, the government misjudged trends in grain production and lacked a careful and comprehensive plan; these reform measures were unsuccessful.

In general, the main feature of reform in the agricultural sector was micro-management institution reform, which gave farmers autonomy in production and allowed them to share profits. The HRS was thus implemented throughout China and replaced the commune system. The successes in the agricultural sector in the early 1980s changed the national leaders' development strategy. A comparative advantage development strategy was gradually phased in to replace the heavy industry strategy. The macro-policy environment was reformed accordingly. Due to the reallocation of economic interests between farmers and urban residents and the policies that were biased against farmers since the establishment of the PRC, reforming the planned resource-allocation mechanism for agricultural production had lagged.

The main characteristic of China's agricultural reform was that most of the reform measures were passive and worked from bottom to top, because the central government did not have a well worked-out reform blueprint and the realities in China were very complicated. The farmers and local cadres attempted these approaches first at the local level, and if they were successful, they could be extended throughout China. The reform measures were intended to solve conspicuous economic problems that the central government encountered at that moment. The intensity of the reforms depended on the government's judgement of society's level of tolerance for the changes. These features were best characterized by Deng Xiaoping as "crossing the river by groping for stones". In other words, the reform would proceed step by step, moving forward at a rate that the central government would deem appropriate at any given time. Although there were ups and downs in the reform process, the goal of the reform has remained unchanged for China's policy-makers and the people. Overall, it has followed the predictions of economic theory. But the future and the measures to reach that goal are not clear.

Reform in the agricultural sector began with the HRS, which gave farmers autonomy in production to some extent and directly linked profits that they earned with the input of labour

they put in. As intended, this reform improved production incentives and created a stream of additional resources. Farmers benefited from profit sharing. As the reform proceeded, conflict between traditional macro-policy environment and reformed micro-management institutions arose and resulted in tensions within the economic system. The government often reacted in the spirit of administrative re-centralization. For example, the adoption of the Provincial Governor Responsibility System (PGRS) in late 1994 and the anti-reform measures of the grain marketing system in 1985 were done to forcefully bring the reformed micro-management institutions and reformed resource-allocation mechanism into line with government policy. Certainly, these approaches did not get the support from farmers who had enjoyed the fruits of decentralization. Consequently, the central government had no other choice but to extend the reform to the macro-policy environment so that it conformed to the reformed micro-management institution and resource-allocation mechanism.

This was how China's incremental reform of agriculture proceeded. The reform was irreversible because it started with a change in the micro-management institution. Once decision-making power on production matters had been given to farmers, it could not be taken away again. Therefore, when inconsistencies within the economy started to cause serious problems, the reform eventually proceeded in such a way that the resource-allocation mechanism and the macro-policy environment were reformed in spite of government reluctance. Despite these ups and downs the reform proceeded in a rational manner. This was fundamentally due to the fact that the root of every economic problem in the agricultural sector that the reform has attempted to solve possessed a logic of its own, which would not change according to policy-makers' wishes.

The reform led to a reallocation of economic interests among different social groups, thus the reform approaches had to be carefully implemented. In order to gain support for the reform from farmers and to win their trust, the central government had to use reform measures that

maintained a balance between growth and stability. There were two major opposing views among policy-makers. One stressed stability and the other stressed speed. The first view emphasized the value of maintaining social stability and a slow process of reform and growth. The second view - with its sense of urgency that was akin to Chairman Mao's belief about the Great Leap Forward - placed more weight on swift change, and tried to establish people's confidence in rapid reform. Both views were alternately reflected in various policies. For example, in 1987 some measures to reform the dual-track price system were initiated by the central government, and consequently they induced inflation in 1988. In order to maintain social stability the readjustment policy was implemented to restrain ever rising prices. Meanwhile, in the reform process, due to the complicated realities of the agricultural sector, conservative or anti-reform measures were often implemented. For example, although the establishment of a market for the transfer of land could promote economic activity in agriculture and was tried in some coastal provinces, this measure could destabilize rural society. This was due to the fact that there were surplus labourers in rural areas, where land was the basis of living for most farmers. Therefore, according to those officials who emphasised stability, this approach could not be used by the central government in the near future.

8.2 Some Policy Suggestions and Trend of Agricultural Reforms

Since the reforms have been introduced, China has not only fed itself but also increased farmers' incomes significantly. In most respects China's agricultural reforms were successful, but there is an urgent need for further reform. After China's entry into the WTO, market-oriented reforms in the agricultural sector were even more irreversible. However, the sequence of the next policy steps is not easy to determine. Due to the complicated realities in China and the different rates of regional development, some reform measures were only applicable to some areas. For example, the market in land transfer exists in coastal and rich provinces and the HRS may have to continue in underdeveloped and inland provinces.

As discussed in Chapter 7, there have always been fluctuations in farmers' incomes. Since 1997 their earnings have increased only slowly. In 2000, farmers' incomes increased slightly further but most of this increase was from husbandry and repatriation from family members working outside the farm. At the same time, income from farming decreased and the income gap between farmers and urban people has widened, potentially disturbing social stability and limiting the scope for further reform in the future.

The research for this thesis supports the following four groups of policy recommendations for further reform in the agricultural sector:

(1). Adjust the structure of agricultural production.

According to the analysis in section 7.5, direct and indirect demand for grain in China slowed down further. Therefore, the proportion of farmers' incomes from farming in the total income would decrease further or rise only marginally. How to adjust the agricultural production system is the core of further reform.

To deal with the shock of grain imports after gaining WTO membership, a direct change that may be made is to adjust the proportions of different grains according to China's regional comparative advantages. Rice production may be expanded to replace other grains. This adjustment was already in process and driven by market forces. Compared to 1995, total sown areas of grain decreased by 4.5% in 2000, whereas the rice area only fell by 2.5% (SSB, 2001). In comparison the wheat area declined by 7.6% (SSB, 2001). Further adjustments could be expected. The capacity to do so, however, is very limited because rice normally requires irrigation, whereas most of China's northern areas, where mainly wheat, corn, soybean and other grains are cultivated, are dry and experience low rainfall. Only the

northeast provinces, i.e. Liaoning, Jinlin and Heilongjiang[1], may have the potential to further expand rice production.

The second adjustment was to replace grain with other agricultural products, e.g., cash crops, vegetables, cotton, oil-bearing crops, tea, fruits, etc. The proportion of sown land for grain in total sown areas fluctuated between 70% and 80% over the past 20 years, and fell to its lowest level - 69% - in 2000, due to low grain purchase prices and relaxation of grain production quotas. The government abolished the grain production quota in the major grain importing provinces in the coastal areas to provide a bigger market for those provinces with a comparative advantage in grain production (see Chapter 6). In fact, production quotas in the major grain producing provinces had also been abolished, because there was still a surplus of grain supply. Formally abolishing the government's quota system and price protection schemes will have a positive effect on the market-oriented structural adjustment in the future.

An oft-used measure employed by farmers to reduce grain production in the short run, in response to price changes, was to reduce the multiple-cropping ratio, instead of replacing grain with other crops. This was due to the limitations of domestic demand for, or information received about, the lack of local and international demand for other crops. This approach can result in wasted resources. With membership of the WTO the target market for agricultural products is not only China but now the world.

[1] Since the mid-1980s reforms of China's system of reclamation and state farms were carried out. Before the reform, local farms were controlled and managed by the Ministry of Reclamation and State Farms. The local government could not manage and plan agricultural production of any farms. The reform led to a decentralized system of management. The Ministry of Reclamation and State Farms was abolished and consolidated into the Ministry of Agriculture as a department. The local farms are controlled and managed by the correlative institution at the provincial level. Only farms in four provinces, namely Heilongjiang, Xinjiang, Hainan and Guangdong, are still directly controlled and managed by the Bureau of Reclamation and Farms in the MoA, because the central government wants to directly control some agricultural products, i.e. rice in Heilongjiang, cotton in Xinjiang, and rubber in Guangdong and Hainan. Furthermore, farms in Xinjiang are controlled and managed by the Xinjiang Constructive and Military Corps, which is controlled directly by the State Council. Employees of the farm are not farmers but workers, and some of them are even soldiers. In other words, they could receive a pension after they retire.

On the other hand, export-oriented agriculture has limited development and so far has been concentrated in coastal areas like Guangdong. In 2000, the export of food and animal products valued at $12.3 billion (U.S.) in China accounted for only 4% of total output value of agricultural products (Hu, 2002). There is limited capacity for further development of export-oriented crops and animal products. Future changes should be made in order to increase the export of labour-intensive products with low land-intensity. However, a major effort would be needed, especially in the remote inland areas, to develop business connections with the international market, and also to develop related human resources, infrastructure and other trading facilities. These long-term tasks would not only provide a buffer to the shock of imported goods, but also lead to the modernization of China's agricultural system.

(2). Deepen the reform of grain marketing system.

Past experiences indicate that government protection of grain prices had a negative impact on farmers' incomes because it distorted market prices (Wang, 2002), and most of the subsidies were absorbed by state-owned grain enterprises (see Chapter 6). In many cases where the government controlled grain prices, which were higher than market prices, to encourage farmers to produce more grain than the market demanded, resulted eventually in falling market prices and a surplus of grain products. This has caused large fluctuations in grain prices and production for several years (Wang, 2001), and seriously injured farmers' profits and production incentives. Although price protection has been given up in theory and direct subsidies instead of indirect subsidies to farmers have been extended throughout China, a formal reform to eradicate price protection, influenced by the government's commitment to WTO policies, would have a positive effect in the future.

The policy problem is to support the position of farmers with low incomes, especially in periods of low prices. To replace the original price protection policy, the effect of a new

policy of directly subsidizing farmers should be considered further. At the same time the ability of central and local governments to pay these subsidies should be taken into account. Market operations of a national grain reserve, or an equivalent in financial terms, is worthy of further study. Providing better information services to farmers can also be helpful. Most importantly, however, more effort can be made to help farmers find employment opportunities in non-grain and non-agricultural activities.

(3). Develop the TVEs and urbanization.

The development of TVEs[2] and increasing the rate of urbanization will absorb surplus labour in rural areas and increase farmers' incomes. A major structural adjustment of transferring agricultural labour and other resources to the industrial and service sectors can be expected. As described in the third section of Chapter 7, the total transfer of agricultural labour to the TVE sector and urban sectors in the 1990s was 68 million people. Yet the agricultural labour force fell by only 22 million, from 366 to 344 million. There was only a minor improvement in labour productivity and farmers' incomes. This change was far slower than in the 1980s. Employment growth in the TVEs stagnated in the late 1990s, and rural-urban migration[3] also faced more resistance from urban society because urban unemployment increased rapidly.

According to past experience and taking into account the current situation, rural industrialization and urbanization combined may absorb 5.1 million rural labourers per year on average from 2001 to 2010, leading to a substantial reduction in the agricultural labour force (344 million in 2000) by 4 million net per year (Wang, 2002). It was predicted by Wang

[2] Certainly, the development of TVEs can increase farmers' incomes, but at the same time it could widen the income difference within different regions' rural areas.

[3] The study by Li (2001) showed that out-migrant farmers had not only a direct effect on the growth of their household incomes but indirectly raised the labour productivity in their households. In the same study, Li argued that most out-migrant farmers came from medium-income families because they were more likely to have both the incentive to improve their lives and the money to travel and look for work. Therefore, the migration of farmers to urban areas for higher incomes could increase farmers' incomes in total, but widen the income gap in rural areas.

(2002) that to fully absorb the grain import shock after the WTO accession, at least an additional 6 million people would be employed by the TVE and urban sectors between 2002-2004 (assuming that 3.2 million people would also move to non-grain agricultural production during this period). This figure is relative to the expectation reported from the 'demand' side that there might be scope for only approximately 5 million people per year to relocate. Clearly the problem will become significant.

Over a longer time period, urbanization could be accelerated through policy adjustment (including removing policy bias against medium and large cities) and improving urban infrastructure (Wang and Xia, 1999). Assuming that the speed of rural-urban migration doubled, then an additional 30 million agricultural workers would move to the urban sector from 2001 to 2010 (Wang, 2002). In this case, the grain stock could be basically absorbed and there would be more improvements in agricultural productivity. Sufficient absorption of the surplus agricultural labour by the industrial and service sectors may require a net reduction in the number of farmers by another 100 million. This may be achieved in the next twenty years.

At the same time, in the urban areas the demand of labour for services would increase, and would absorb many people from rural areas. In China, the System of Registered Permanent Residence (SRPR, *Hu Kou*) is still being implemented, which limits rural-urban migration. The reform and abolition of SRPR would facilitate agricultural workers being employed in non-agricultural activities. It was pointed out by Hu (2002) that the transfer of 1% of agricultural labour to non-agricultural industries would show an increase of 0.5—0.85% of GDP and 0.19—0.34% of total consumption.

Additionally, it should be emphasized that the Household Responsibility System should continue in the inland regions, and the market for transferring land should be tried conditionally in these areas in order to sustain social stability and resources for farmers.

(4). Increase the investment in rural infrastructure and rural education.

From 1998 when Zhu Rongji was elected as Premier, a policy of investing more in infrastructure and raising government officials' salaries by issuing treasury bills was introduced. These measures mainly benefited urban residents, not farmers.

Due to the introduction of the Household Responsibility System and abolition of the commune system, many irrigation works have not been repaired, which has hindered the development of agriculture. However, since the reforms the share of government expenditure on agriculture has declined from 13.43% in 1978 to 8.23% in 1999 (see Figure 7.4). Policy-makers in the central government transferred rural investment to the local government and farmers. Due to the low benefits of the agricultural production and the limited farmers' investment ability, however, it is impossible to rely on local governments and farmers for sufficient investment in rural infrastructure. Therefore, the central government should invest in rural infrastructure and increase this investment annually.

According to Figure 7.4 it can be seen that during 1978—2000 the share of agricultural and related taxes on total government tax revenue remained stable, in the range of about 2%—6%. These taxes were not a burden for farmers in some coastal provinces because the developed TVEs could provide them with enough income to pay the taxes. However, for most farmers, especially in the inland poor provinces, the taxes were too high to pay. In some areas the local cadres imposed even more taxes. Li Changping recommended that the government should abolish agricultural taxes for farmers after so many great sacrifices had been forced on them in the name of industrialization since the establishment of the PRC in 1949.[4]

[4] Li Changping is the deputy of the National People's Congress (NPC), PRC. He provided this policy suggestion to Premier Zhu Rongji at a meeting of the full session of the NPC, March 2002. His suggestion was shared by

In his work report for the annual conference of the National People's Congress in March 2004, Premier Wen Jiabao promised that taxes on farmers would be reduced by one per cent this year, and be abolished completely in five years (*Xinhua News Agency*, 18 March 2004). This proposal was supported by the national deputies who thought it would reduce farmers' burdens and increase their incomes (*Daily of China's Economy*, 15 March 2004).

Some critics suspected there were other reasons behind why this policy was suggested. For example, in Ningbo City in the province of Zhejiang, which is very rich, the per capita income of farmers in 2003 was 6,221 RMB *yuan* and their taxes were only 12.5 RMB *yuan.* The 0.2 % increase will have very little effect on farmers' total incomes. Even in some poorer regions the impact of abolishing agricultural taxes will be limited (*Financial and Economic Daily*, 14 March 2004). Some critics noted that the real burden on farmers is the administrative charges imposed by local cadres, which are four to six times higher than the taxes (in some regions, even higher). The reduction and abolition of taxes may incur increases in administrative charges. The practical approach to alleviating farmers' burdens will be to abolish these administrative charges (*Daily of China's Youth*, 14 March 2004). Some experts think the abolition of agricultural taxes should focus on poor regions and grain-producing areas. The central government should send special funds to local governments because a part of agricultural taxes goes toward maintaining some local government services. If the central government does offer any compensation, local governments will have to impose other measures on farmers (*Daily of Economy*, 19 March 2004).

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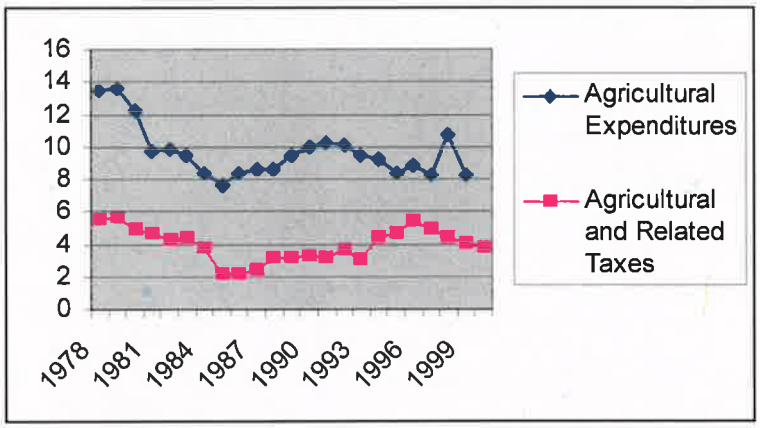
many other deputies of the NPC (*People's Daily*, 16 March, 2002). He has a Masters degree and once worked as a town director in Hubei province, and now carries out research on agricultural problems. After the meeting in March 2002, he published a book named *Some Suggestions to the Premier,* in which he presented his research results on China's agricultural problems and provided policy recommendations.

Figure 8.1: The Share of Government Expenditure on the Agriculture in Total Government Expenditure, 1978-1999; the Share of Agricultural and Related Taxes in Total Government Tax Revenue, 1978-2000



Source: SSB, 2001

In rural areas, primary education is supported by collectives and individual household, not like urban areas sponsored by the governments and individual household. According to China's Education Law passed by the National People's Congress, the nine-year mandatory education experience for all children should be free. In practice, however, both urban and rural residents have to pay fees.[5] This education fee has been a large burden for farmers and many rural children were forced to drop out of school.[6] The presence of more and more uneducated labourers will erode the structure of rural human capital, and at the same time more skilled labourers are tempted to work in non-agricultural industries providing better wages. All these factors will damage the future growth of incomes in rural China. Accordingly, the central government should invest more in rural infrastructure and be responsible for primary education in rural areas.

In general, according to the analysis in this thesis, five trends are emerging in the area of agricultural reforms. First of all, policy-makers will gradually change their biased assumption

[5] For example, when the author's nephew went to primary school, it was usual to pay RMB 20,000 *yuan* as a 'donation' to the school. This amount is about the same as the author's sister's annual salary (she is a prosecutor and her salary is relatively higher in my home town, Zhenjiang City, Jiangsu).

[6] According to the Statistics Communique on China's Education in 1998 by the Ministry of Education (*Daily of China's Education*, 22 May 1999), only 73% of the population experience the nine-year mandatory education policy.

that farmers' task in agricultural production is simply to provide food for urban residents, raw material for industry, and accumulation of capital for industrialization and urbanization. Agricultural and industrial production, farmers and workers must be treated equally by China's policy-makers.

(1). Although several rounds of reforming the grain marketing system since the mid-1980s have been unsuccessful, reform is still the main task for policy-makers in the near future, because only a complete market system can estimate price indicators for agricultural production. Besides reforming the grain marketing system, many other measures have been adopted to protect farmers' benefits, such as a national system of grain reserve and direct subsidy instead of indirect subsidy through price protection. In the process of reforming the grain marketing system, some administrative measures such as the Provincial Governor Responsibility System would disappear entirely.

(2). Heavy burdens on farmers and the low growth of their incomes has hampered the establishment of a consolidated and complete market economy throughout the whole of China. And famers' low consumption patterns have restricted the further development of industry. In order to increase farmers' incomes the structure of agricultural production should be changed through government measures and markets forces, and directly subsidising grain-producing farmers throughout China. Agricultural taxes and administrative charges should be gradually phased out as well.[7]

(3). The central government would take the responsibility of investing in agricultural projects and primary education in order to develop agricultural production and human resources.

[7] In fact the process of abolishing and combining some local governments at the town and village level has begun, according to information from the Ministry of Civil Affairs. At the end of 2003 the number of towns and villages was 38,290. Compared to 1987, the number had decreased by 47% and compared to 1999, decreased by 16%. Consolidating some small towns and villages will promote administrative efficiency and reduce local governments' budgets, thus alleviating impositions on farmers and increasing their incomes (*Financial and Economic Daily*, 13 March 2004).

(4). The Household Responsibility System (HRS) would be improved in the inland and underdeveloped regions and the transfer market of land will increase productivity in the coastal and developed regions of China. With economic development, the transfer market of land would gradually appear and be encouraged by local governments in some inland regions.

(5). The System of Registered Permanent Residence (SRPS) would be gradually relaxed or even abolished so that rural and urban residents are treated equally and improve the migration of people from rural to urban areas. Before the abolition of the SRPS, the same conditions of insurance for medical treatment[8], education and retirement[9] should apply to both rural and urban people.

It can be summarized that trends 1, 2 and 3 will happen in the short-term, and trends 4 and 5 will happen in the long-term, depending on how the first three trends progress. Lastly, the market economy established in China should be the same for workers and farmers, rural and urban residents, and rural and urban areas, but it will take a long time to reach this goal. It should be added that the implementation of reforms may take a backward step, i.e. some administrative measures being adopted to solve some policy problems.

8.3 Limitations of this Thesis

This thesis researches four major aspects of China's agricultural reforms: land system; regional comparative advantage; grain marketing system; and farmers' incomes. These four issues are far from constituting the whole of China's agricultural reforms. To understand the difficulties of China's agricultural reforms comprehensively and provide more feasible policy

[8] Before the reform, farmers enjoyed cooperative medical insurance. The right of cooperative medical insurance was written into the Constitution (1978 edition) as a basic right for all farmers (Article 50, Chapter 3). Since the collapse of the commune system, cooperative medical insurance has been abolished. Now farmers have to pay for their own medical treatment. On other hand, urban residents still enjoy free medical care and have done so since the founding of the PRC.

[9] In rural areas most farmers have to depend on their children for a living after they are too old to work on the land. This is the main reason why family planning is not carried out smoothly in rural areas.

recommendations, some problems need to be further researched. For example, some researchers and officials advocate that the privatization of rural land is the only way to solve the "three agricultural problems". This opinion is interesting and needs to be studied. Taking into account the current situation in China, however, this opinion may be true in theory but not in practice. This thesis thus only studies the transfer market of land rather than the privatization of land. On the other hand, to understand the difficulties in the grain marketing system and the feasibility of suggested policy changes, state-owned grain enterprises should be studied as well. Due to the non-availability of the related data and a discussion of other problems, the reform of state-owned grain enterprises had to be omitted from the research scope of this thesis. The references to China's history were included in this thesis in order for the reader to have a comprehensive grasp of the context in which China's farmers have worked in agriculture.

This thesis provides some policy implications for China's policy-makers through research of past reforms. China is the largest developing country in the world, and both its successful and unsuccessful agricultural reforms will provide some valuable lessons for other developing countries. The thesis investigated some major problems regarding agricultural reforms, and at the same time, put forward feasible policies and predicts the path of future developments.

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APPENDICES

Appendix A:
Comparison of Estimated and Actual Grain Production, 1989 to 2000 (million tons)

	Q *	Q_1 **	Q_2**	Q_1-Q **	Q_2-Q**	(Q_1-Q) /Q (%) **	(Q_2-Q) /Q (%) **
1989	407.55	426.43	425.40	18.88	17.85	4.63	4.38
1990	446.24	428.48	428.80	-17.76	-17.44	-3.98	-3.91
1991	435.29	432.40	432.45	-2.89	-2.84	-0.66	-0.65
1992	442.66	438.73	438.63	-3.93	-4.03	-0.89	-0.91
1993	456.49	448.21	447.39	-8.28	-9.1	-1.81	-1.99
1994	445.10	465.51	464.50	20.41	19.4	4.58	4.36
1995	466.62	481.36	480.54	14.74	13.92	3.16	2.98
1996	504.54	490.15	488.43	-14.39	-16.11	-2.85	-3.19
1997	494.17	490.48	488.39	-3.69	-5.78	-0.75	-1.17
1998	512.30	494.97	491.91	-17.33	-20.39	-3.38	-3.98
1999	508.39	495.28	491:15	-13.11	-17.24	-2.58	-3.39
2000	462.18	488.99	492.43	26.81	30.25	5.80	6.55

Notes:
** Q is the actual output of grain. Statistical Yearbook of China, various issues, SSB.*
***Q_1 is the calculated by using the provincial models, and Q_2 using the same model in the nation level.*

Appendix B:
Marketing Channels in Jilin, Jiangxi, Sichuan, Shangdong and Henan Province, 1999 and 2000

Volume (jin) by province, 1999

	Rice	Wheat	Corn	All Grains
Sample Total				
State	862847	285694	927902	2076443
Processing Enterprises	84615	10702	87800	183117
Private Trader	154329	245326	727031	1126686
Country Fair	39304	88387	155646	283337
Total	1141095	630109	1898379	3669583
JILIN				
State	219218	0	902689	1121907
Processing Enterprises	43710	0	60600	104310
Private Trader	3000	0	453250	456250
Country Fair	3500	2900	14200	20600
Total	269428	2900	1430739	1703067
JIANGXI				
State	604301	0	14000	618301
Processing Enterprises	40105	0	0	40105
Private Trader	140829	0	500	141329
Country Fair	19466	0	0	19466
Total	804701	0	14500	819201
SICHUAN				
State	39328	33793	0	73121
Processing Enterprises	0	0	0	0
Private Trader	3000	140	0	3140
Country Fair	14438	7572	4220	26230
Total	56766	41505	4220	102491
SHANDONG				
State	0	86651	6413	93064
Processing Enterprises	0	5622	2500	8122
Private Trader	0	104122	202041	306163
Country Fair	1500	41661	75906	119067
Total	1500	238056	286860	526416
HENAN				
State	0	165250	4800	170050
Processing Enterprises	800	5080	24700	30580
Private Trader	7500	141064	71240	219804
Country Fair	400	36254	61320	97974
Total	8700	347648	162060	518408

Source: Household Survey

Share (%) by province, 1999

	Rice	Wheat	Corn	All Grains
Sample Total				
State	76	45	49	57
Processing Enterprises	7	2	5	5
Private Trader	14	39	38	30
Country Fair	3	14	8	8
Total	100	100	100	100
JILIN				
State	81	0	63	66
Processing Enterprises	16	0	4	6
Private Trader	1	0	32	27
Country Fair	2	100	1	1
Total	100	100	100	100
JIANGXI				
State	75	0	97	75
Processing Enterprises	5	0	0	5
Private Trader	18	0	3	17
Country Fair	2	0	0	3
Total	100	0	100	100
SICHUAN				
State	69	81	0	71
Processing Enterprises	0	0	0	0
Private Trader	5	1	0	3
Country Fair	26	18	100	26
Total	100	100	100	100
SHANDONG				
State	0	36	2	18
Processing Enterprises	0	2	1	2
Private Trader	0	44	71	58
Country Fair	100	18	26	22
Total	100	100	100	100
HENAN				
State	0	48	3	33
Processing Enterprises	9	1	15	6
Private Trader	86	41	44	42
Country Fair	5	10	28	19
Total	100	100	100	100

Source: Household Survey

Volume (jin) by province, 2000

	Rice	Wheat	Corn	All Grains
Sample Total				
State	715124	280423	536247	1531794
Processing Enterprises	134205	22970	2400	159575
Private Trader	254130	373296	1142310	1769736
Country Fair	61860	78916	281894	422670
Total	1165319	755605	1962851	3883775
JILIN				
State	197422	0	532728	730150
Processing Enterprises	0	0	700	700
Private Trader	8200	0	729970	738170
Country Fair	51760	1400	137371	190531
Total	257382	1400	1400769	1659551
JIANGXI				
State	480430	1100	2186	483716
Processing Enterprises	133805	1000	0	134805
Private Trader	229490	0	1300	230790
Country Fair	500	0	18841	19341
Total	844225	2100	22327	868652
SICHUAN				
State	36972	17476	0	54448
Processing Enterprises	0	0	0	0
Private Trader	12400	7692	3490	23582
Country Fair	9600	1855	431	11886
Total	58972	27023	3921	89916
SHANDONG				
State	0	67964	1333	69297
Processing Enterprises	0	14170	0	14170
Private Trader	3000	155288	200195	358483
Country Fair	0	60216	81809	142025
Total	3000	297638	283337	583975
HENAN				
State	300	193883	0	194183
Processing Enterprises	400	7800	1700	9900
Private Trader	1040	210316	207355	418711
Country Fair	0	15445	43442	58887
Total	1740	427444	252497	681681

Source: Household Survey

Share (%) by province, 1999

	Rice	Wheat	Corn	All Grains
Sample Total				
State	61	37	27	39
Processing Enterprises	12	3	1	4
Private Trader	22	49	58	46
Country Fair	5	11	14	11
Total	100	100	100	100
JILIN				
State	77	0	38	44
Processing Enterprises	0	0	1	1
Private Trader	3	0	52	44
Country Fair	20	100	9	11
Total	100	100	100	100
JIANGXI				
State	57	52	10	56
Processing Enterprises	16	48	0	16
Private Trader	26	0	6	26
Country Fair	1	0	84	2
Total	100	100	100	100
SICHUAN				
State	63	65	0	61
Processing Enterprises	0	0	0	0
Private Trader	21	28	89	26
Country Fair	16	7	11	13
Total	100	100	100	100
SHANDONG				
State	0	23	1	12
Processing Enterprises	0	5	0	2
Private Trader	100	52	71	62
Country Fair	0	20	28	24
Total	100	100	100	100
HENAN				
State	17	45	0	28
Processing Enterprises	23	2	1	1
Private Trader	60	49	82	62
Country Fair	0	4	17	9
Total	100	100	100	100

Source: Household Survey