

ZHOU LI, CHANGQING REN¹

AGRICULTURE TRANSITION IN CHINA: EXPERIENCES AND LESSONS

Abstract: Agricultural development since the beginning of the reform era has played a vital role in China's economic transition. First the rural reforms instituted during the household responsibility system period significantly improved agricultural output and productivity while simultaneously lifting hundreds of millions of farmers out of absolute poverty. Secondly, the massive labor flow from rural to urban areas due both to increases in agricultural productivity and systemic policy reforms associated with labor mobility also resulted in significant economic growth. This shift in the workforce is a major factor in explaining China's success with respect to both industrialization and urbanization. Thirdly, agricultural development, including increases in gross output as well as improved production efficiency, has enabled China to respond effectively to the challenge of feeding 1/5 of the world's population while relying on only 7% of the world's arable land. This article summarizes the history of China's agricultural transition, reviews its major achievements, and analyzes lessons learned.

I. BACKGROUND

In 1949, China's economy was based largely on its farming sector, and farming families, with low rates of accumulation. To speed up development of industry, particularly heavy industry, and to accomplish a goal of catching up with and surpassing developed economies, China had to maximize its collection of agricultural surplus, and push the accumulation rate up to 12% or higher, whilst maintaining low costs for labour and raw materials needed for industrial development by all means possible.

Two approaches are available for the purpose of collection of agricultural surplus, one is financial and the other is fiscal management. A financial approach is built on a combination of accurate and flexible financial policy, well-structured financial organizations and the development of flexible and multiple financial tools. These financial conditions were unavailable in China at that time, so a fiscal management

¹ Authors work for Rural Development Institute, Chinese Academy of Social Sciences.

approach became the natural choice. There were two options for the fiscal management approach, strengthening taxation intensity or altering trade conditions. Given the trauma the pre-1949 Government had created in minds of the Chinese people best typified by excessive taxation rates, the new Government discarded the idea of increasing taxation and selected an option of distorting trade conditions between industrial and agricultural products, later termed as using the „price scissors” to control relative prices of industrial and agricultural products. An additional benefit of altering trading conditions between the two sectors is that such a policy significantly lowered labour and raw material costs and hence allowed industrial development.

At that time, China’s non-agricultural industries were controlled by private enterprises. Unsatisfied with the benefits the Government made available by distorting trade conditions of industrial and agricultural products at the purchasing stage, these enterprises manipulated the market order by the storage of goods so that urban residents had to accept higher living costs. Realizing that policies that distorted trade conditions between industrial and agricultural products failed to function as expected, the new Government introduced a new policy of a State Monopoly for purchase and marketing.

Whilst the State Monopoly for purchase and marketing policy effectively enabled the Government to collect agricultural surplus while lowering the living costs of urban residents, it was unrealistic to scale up the policy to include all agricultural products. Chinese agriculture at that time was largely characterised as having semi self sufficient farm households with a low degree of agricultural product commercialisation. To increase income when the prices of a limited number of products were controlled, farmers reduced the production of state-controlled products, and expanded production of other agricultural products. When the State was unable to realise its monopoly procurement and distribution plan through management of individual farmers, a new organization system enabling management of farmers was considered necessary, and the creation of agricultural communes was regarded as the best choice at the time. Chen Yun, Vice Premier in charge of the economy at that time, put forward a vivid metaphor: „farmers are like the hair of a woman, large in number, scattered, and uneasy to hold”. The creation of the People’s Commune system was intended to „comb the hair into a braid” so that all the hair could be held with ease. The People’s Commune System, started by uniting organized production, and was able to integrate the state controlled procurement and distribution plan to each individual agricultural household, and the objective of aligning agricultural production with plans of the state-controlled procurement and distribution was realised.

This reveals the evolution of a Trinity of trading conditions(distortion, state monopoly for purchase and marketing, and the People’s Commune System) and was the result of the state strategy which required collecting agricultural surplus, lowering living costs for urban residents, and enhancing industrial development. With this system, China pushed its accumulation rate to over 12%, and maximized its cost reduction with respect to labour costs and industrial raw materials, at a less developed stage with low per capita GNP, so that a fundamentally complete industrial system was established, and the research and development of the atomic bomb, the hydrogen bomb and the satellite were accomplished in a shorter period than any thought possible.

With a tight financial accounting system, despite trading conditions of industrial and agricultural products being distorted, China was able to eradicate the phenomenon of rent-seeking. Hence, a large problem of a planned economy was not corruption, but the fact that the power of agricultural production was not fully realised and farmers were trapped in a cycle of long-term poverty. Tables 1 to 3 show that over the 20 years from the introduction of the People's Commune System in 1958 to the reform and opening up programs promulgated in 1978, neither per capita agricultural products nor farmers' supply of per capita commercialised agricultural products in China showed any visible increases. Over this same period, the annual increase of farmers' income was less than RMB 3 and due to lack of comparative advantage of the prioritised industries, businesses had weak viability and product competitiveness, and could only survive in closed, protected, environments. Whilst the collected agricultural surplus was mainly invested in heavy industry, heavy industry was in self-circulation, and light industry was confronted with an insufficient supply. As a result, international trade was dominated by exports of agricultural products².

TABLE 1. National Per Capita Possession of Major Agricultural Products, 1957–1978. Unit: kg
TABELA 1. Podstawowe produkty rolne przypadające na obywatela w latach 1957–1978 (w kg)

| | 1957 | 1962 | 1965 | 1970 | 1975 | 1978 |
|------------------|------|-------|------|------|-------|-------|
| Grain | 306 | 240.5 | 272 | 293 | 310.5 | 318.5 |
| Cotton | 2.6 | 1.15 | 4.95 | 2.8 | 2.6 | 2.25 |
| Edible oil | 6.1 | 3.6 | 5.05 | 4.6 | 4.95 | 5.45 |
| Meat | 6.25 | 2.9 | 7.7 | 7.3 | 8.7 | 8.95 |
| Aquatic products | 4.9 | 3.4 | 4.25 | 3.9 | 4.8 | 4.85 |

Source: *40 Years of China's Countryside*, Central Peasants Publishing 1989, p. 132.

TABLE 2. Average supply of commercialized agricultural products of each agricultural individual, 1957–1978. Unit: kg per capita

TABELA 2. Średnia produkcja komercyjnych produktów rolnych na rolnika w latach 1957–1978 (w kg/os.)

| | 1957 | 1962 | 1965 | 1970 | 1975 | 1978 |
|------------------|-------|-------|-------|-------|-------|-------|
| Grain | 85.05 | 57.85 | 64.90 | 66.10 | 67.35 | 62.60 |
| Cotton | 2.65 | 1.15 | 3.25 | 2.90 | 2.85 | 2.60 |
| Oil | 1.95 | 0.65 | 1.40 | 1.45 | 1.00 | 1.10 |
| Swine | 0.075 | 0.034 | 0.130 | 0.108 | 0.132 | 0.135 |
| Aquatic products | 3.20 | 2.65 | 3.05 | 2.85 | 3.25 | 3.30 |

Source: *40 Years of China's Countryside*, Central Peasants Publishing 1989, p. 133.

TABLE 3. Peasants' Income Per Capita, 1957–1978

TABELA 3. Dochód na głowę w rolnictwie w latach 1957–1978

| | 1957 | 1962 | 1965 | 1970 | 1975 | 1978 |
|---|-------|--------|--------|--------|--------|--------|
| Income Per capita (Yuan) | 87.57 | 111.53 | 117.27 | 129.25 | 133.45 | 133.59 |
| Among which: Income from collective (%) | 49.6 | 47.4 | 53.9 | 60.6 | 57.0 | 58.3 |
| Income from household subsidiary business (%) | 41.2 | 45.4 | 37.0 | 32.8 | 36.8 | 35.6 |
| Other (%) | 9.2 | 7.2 | 9.2 | 6.6 | 6.2 | 6.1 |

Source: *40 Years of China's Countryside*, Central Peasants Publishing 1989, p. 130.

² This issue is beyond the scope of this article, and cannot be addressed given limitations on length and also because we wish keep to the central topics that are introduced in the following sections.

II. AGRICULTURE TRANSITION IN CHINA

2.1 Transition from Collective Operation to Household Operation

The effectiveness of collective production in agriculture has been questioned repeatedly since the initiation of the People's Communes. This was particularly the case when drastic reductions in production occurred, and the impacted farmers tended to return to the self sufficiency to survive; a strategy even tacitly approved by some leaders. However, due to the influence of ideology, once agricultural production bounced back, the government would block any resulting practices which were regarded as „off the track” of public ownership. The resurgence of household-based farming operations in the late 1970s was actually another attempt by the farmers to improve their conditions. But the difference this time was the Central Committee of the Communist Party of China (CCCPC) tolerated it as an exception, though formal consent was still some years away. Following this, policies reflecting an acceptance of the practice were gradually formulated. As a result, agricultural household-based farming was rapidly scaled up in China. The specific policy changes are summarised below.

In September 1979, the *Decisions on Some Problems Regarding Accelerating Agricultural Development* passed by the CCCPC explicitly stated that any given location could not adopt *the household responsibility system, unless special needs exist for some subsidiary businesses and some individual households are geographically isolated or poorly connected by transportation*. This is the first formal claim in CCCPC documents that the household responsibility system would be allowed to exist as a special case, an exception of which the impact can never be underestimated. No. 75 CCCPC document titled: *Some Issues Regarding Further Accelerating and Optimising Agricultural Production Responsibility System*, printed and distributed in September of 1980, further allowed that *in isolated mountainous areas and poor and under-developed areas (...) when household responsibility system is requested, approvals should be granted, in the form of either [the] household responsibility system or [the] household-based contract system*. In line with the spirit of the document, the proportion of the number of agricultural production teams adopting either the household responsibility system or household-based contract system out of the total production teams quickly soared to about 20% in late 1980 from 1.1% at the beginning of the year. By then, the poorest production groups in the country had all adopted the household responsibility system or household-based contract system. The documents issued in 1981 and 1982 regarding relaxing and lifting constraints on the operation of agricultural households respectively encouraged production groups below and above the average 30% to adopt the household responsibility system or the household-based contract system. The No. 1 CCCPC Document in 1983 even explicitly pointed out that *the household contract responsibility system is a combined business model of both individual operation and united operation in the socialist collective ownership economy. Within this model, individualized household operations are only one business level of the cooperation economy, a new type of household operation. It is different in nature from the small private individual economy and should not be mixed up*. Further, the

household contract responsibility system *can both fit the present situation of manual labour dominance and characteristics of agricultural production, and meet demands for production in the process of modernization*. Next, the 15% of production groups with a „good” rating were also included in the household responsibility system or the household-based contract system. In 1984, with the No. 1 CCCPC Document discussing measures and approaches to consolidate and optimise the household-based contract system, the top 4% of production teams in terms of performance were also included in the household responsibility system or the household-based contract system. The above review demonstrates that the household responsibility system and the household-based contract system were „bottom up” choices of farmers, but rapid promotion across the country was a top down practice based on successful experiences and lessons learned during the process as well as the result of discarding the old people’s commune system.

Statistics show that from 1978 to 1984, China’s agricultural output achieved an average annual growth rate of 7.7%. An estimate made based on production function analysis demonstrates that 46.89% of the productivity increase resulted from the household contract responsibility system reforms. (Yifu Lin’s estimate is 42.2%). At the same time, gross production of grain climbed from 304 million tonnes to 407 million tonnes; average income of farmers grew from RMB 133.6 to RMB 355.3; the absolute number of the rural poor dropped from 250 million to 130 million, and the incidence of poverty went down to 15.1% from 30.7% to 15.6%.³

2.2 Transition from Traditional Agriculture to Modern Agriculture

The effects of this systemic transformation whereby the household responsibility system replaced collective operations was a „one off” result. By 1984, the household responsibility system had been fully accepted in China, and the contribution of the household responsibility system to growth of agriculture had peaked. After 1985, the goal of agriculture development was to cultivate new agricultural business entities on the foundation of household operation, and gradually transform traditional agriculture to a modern agriculture. This transition, while actually fairly slow during the final years of the last century, gradually picked up in speed after 2000; nevertheless, it is still far from being completed.

2.2.1. The Development of Household Farms with Suitable Production Scale based on the Land Rental System

By the end of 2011, 2.288 billion agricultural households in China had contracted arable land from collectives, of which, households with an operation of less than 10 mu accounted for 85% of the total number of contractors. It is hard for households to develop modern agriculture in areas where households have access to less than 2/3 hectare unless they cultivate very labor-intensive, capital-intensive value-added

³ Definition of poverty in China: nutritionists draft a food list according to the fundamental nutritional requirements and one could calculate how much he would need to spend to buy foods he wants according to the prices on the list. When this spending divided by the Engle Coefficient (0.65), one would get the income indicator to maintain subsistence. People living below this standard are classified as poor people.

projects such as vegetables and flowers. That is why many farmers began operating non-agricultural businesses in rural areas⁴ or alternately moved to urban areas to start non-agricultural businesses or work. With the growth of this population, and especially through efforts related to stabilization of their employment, land circulation strategies quickly emerged in rural areas throughout China. Figure 1 shows that in 1992, transferred arable land accounted for only less than 1% of the total household contracted arable land supply. This climbed up to 3.6% in 2005, an increase of 2.7% in 13 years, indicating an annual average growth rate of 0.2%. By 2013, the share soared to 26%, indicating an increase of 22.4% in the 8 years from 2005 to 2013, with an annual average growth of 2.8%. Land transfers are occurring at a much faster pace in the current period. In the more developed Eastern China, the transfer rate for arable land is even higher: transferred land accounted for 60.1% of the total contracted land area in Shanghai, 48.2% in Jiangsu and Beijing, and 42.9% in Zhejiang.

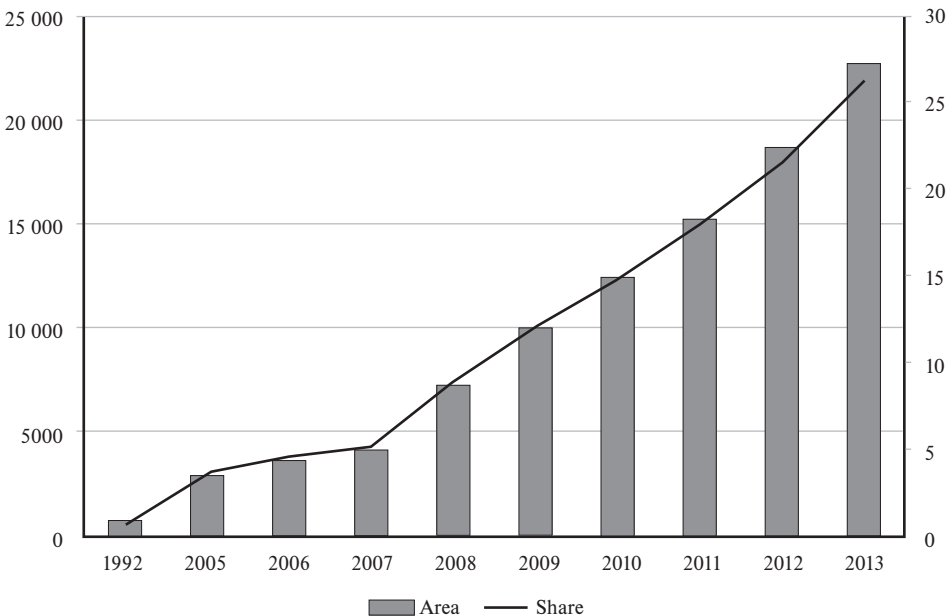


FIGURE 1. The rented land areas and its growing share of the total contracted arable land
 RYSUNEK 1. Tereny dzierżawione i ich rosnący udział w całości zakontraktowanych gruntów rolnych

Source: The Ministry of Agriculture.

⁴ Two reasons determined urban areas were unable to absorb farmers who were wishing to work in cities in mid 1980s, one was the fact that urban cities lagged behind in reform compared with rural areas, and the other was that tens of millions of knowledge youth returning cities with the end of the Cultural Revolution were looking for jobs, too. Therefore the policy at that stage was farmers were allowed to leave their land or non-agricultural businesses but not allowed to leave rural areas. In comparison with the policy that farmers must be with agriculture in the people's commune era, it was a noticeable step forward. The 1990s policy was an even larger step forward that allows farmers to leave their land and rural areas. The above review reflects the progressive characteristic of China's reform.

In the beginning, land operation rights were mainly circulated between relatives and friends with low circulation fees. More recently, with increasing rent rates, land operation rights gradually flow to new micro business entities such as household farms with higher bids⁵, which has boosted the development of household farms. A survey made by the Ministry of Agriculture on household farms in March 2013 indicates that by the end of 2012, household farms in 30 provinces, autonomous regions and municipalities (excluding Tibet) numbered 877,000, controlling a total arable land area of 176 million mu (10.8 mln Ha), representing 13.4% of the total national contracted arable land. On average, each household farm has 6.01 workers, of which 4.33 are family members and 1.68 are long-term employees. Of all household farms, those planting field crops numbered 409,500, or 46.7% of the total; livestock operations accounted for 399,300, or 45.5%; mixed field crop and husbandry operations had 52,600, or 6%; and other types of operations accounted for 15,600, or 1.8% of the total. In terms of size, farms managing land below 50 mu (1 mu = 614.4 m², 50 mu = 3.07 ha) numbered 484,200, or 55.2% of the total; 50–100 mu (3.07–6.14 ha) 189,800, or 21.6%; 100–500 mu (6.14–30.70 ha), 170,700, or 19.5%; 500–1000 mu (30.70–61.4 ha), 15,800, or 1.8%; and above 1000 mu (>61.4 Ha), 16,500, or 1.9%. In 2012, all household farms recorded a total income of RMB 162 billion, averaging RMB 184,700 for each farm.

2.2.2 The Development of Professional Agricultural Households

In many households where the main source of labour is derived from migrant workers, farmers are reluctant to cede their rights to their contracted land. Instead they prefer to employ various professional farmers to complete different kinds of farming jobs on their land on a „pay as you go” basis, such as ploughing, sowing, spraying, and harvesting etc. This has fuelled the development of professional (mechanized) agricultural households. National mechanized agricultural households realized an income of RMB 59.3 billion in 1990, with revenues increasing to RMB 260.6 billion in 2005, and to RMB 447.9 billion in 2012. This reflects an average annual increase of RMB 13.4 billion over the first 15 years, and even greater growth to RMB 26.8 billion during the span of the last 7 years.

TABLE 4. Income change of mechanised agricultural households since 1990 (RMB million Yuan)
TABELA 4. Zmiany w przychodach zmechanizowanych gospodarstw rolnych od 1990 r. (w mln RMB)

| Year | Income | Year | Income | Year | Income |
|------|--------|------|--------|------|--------|
| 1990 | 59300 | 2003 | 226968 | 2008 | 346650 |
| 1995 | 103680 | 2004 | 242150 | 2009 | 389409 |
| 2000 | 200000 | 2005 | 260610 | 2010 | 424790 |
| 2001 | 204000 | 2006 | 281100 | 2011 | 450900 |
| 2002 | 215000 | 2007 | 298600 | 2012 | 477900 |

Source: The Ministry of Agriculture.

By way of example, statistics show that since 1996, professional households with combine-harvesters moving from South to North, taking advantage of the different wheat maturing times have extended the annual use period of the average combine

⁵ Fundamental conditions of household farms: farm manager has a rural resident registration; most labors are family members; main income comes from agriculture; and its operation scale stably stays above standards set by agricultural departments of county level or above.

to more than one month, up from 7–10 days in the past. The increased efficiency in the use of agricultural machinery has enabled these households to improve their operational effectiveness without increasing their fixed costs. Currently, this cross-regional service model has been promoted for harvesting and other production stages for crops such as rice and corn. More than 70,000 corn combines were employed for cross-regional harvesting in major grain producing areas nationwide in 2013, with a single combine servicing an average of 915 mu per year.

With the expansion of the scale of planting, demand for drying crops using drying machines (as compared with allowing crops to dry in the field) have been increasing rapidly. This technology will noticeably reduce the area of land now used for off-field grain drying. Technology related to maintaining product quality in the drying process is still not widely available.

2.2.3 The Development of Agricultural Businesses through the Household Corporate Farm Model

The trend of some family farms in recent years, of acquiring land through rental agreements with other households, and their need to acquire additional non-family labor to match the larger scale of the operations, has created a new type of farm that might be called the household corporate farm. The household corporate farming model can be generally described as more appropriate for land-extensive field crops, while the family farm model is more appropriate for capital-intensive agricultural products with continuous daily output, such as animal farming, aquaculture, vegetables, fruits and flowers. Overall, the household corporate farm models are suitable for three sectors: the first is housed agriculture with large-scale livestock breeding. Compared with field crops, these agricultural products are featured by higher degrees of standardization, high investment intensity, usually higher returns to economies of scale, and better development and profitability prospects. The second is agricultural product processing. Agricultural products, including grains and oil, aquatic products, vegetables, fruits and special agricultural products, offer greater potential as having value added. The third area relates to production services. The priorities for such services include seeding services, agricultural input supply chain management and logistics related to agricultural products, cross-regional machinery operation, and agricultural information services, among others. These areas not only have the potential to make the greatest economic and production contributions, but they are also priority areas of the state policy.

In China, pork consumption accounts for 64% of total national meat consumption, a case study of swine production was made to analyze the development of large-scale animal farming dominated by agricultural companies. Until the end of the 20th century, over 90% of China's fatteners were raised by individual farmers. Over the past few years, large-scale live pig farming in China has been developing rapidly, and a number of agricultural businesses have emerged with an annual production capacity of 100,000 or more. For example, the company, Guangdong Wen Foods, reports production of over 1 million fattened pigs per year. In 2005, fatteners produced by households with a capacity of 50 head or more accounted for 38% of the total; this increased to 51% in 2008, 62% in 2009, 65% in 2010, and is estimated to reach about 70% in 2013.

The case is similar for dairy cows. The number of farms with 100 cows or above increased to about 40% of total in 2012, and operations with 300 cows or greater accounted for approximately 30%. Poultry farming witnessed even faster progress in expanding its scale of production.

The development of agricultural businesses is helping to improve resource allocation of both field crop production and animal husbandry through increases to scale and improved production efficiency, while also allowing faster technological development, more efficient supply chains and greater promotion of agricultural corporations. Agricultural businesses are bound to replace small-scale farm production; a trend which in turn will influence employment and income growth among small farmers as the rural social security system is still being developed.

2.3. Transition from Field Crop Agriculture to Husbandry-dominated Agriculture

Figure 2 shows that crop production accounted for 85.9% of China's total agricultural output value in 1952, while husbandry accounted for only 12.5%. In contrast, in 2012, crop production declined to 52.5% of value while husbandry increased to 40.1%. The year 2008 recorded the largest shift, when crop production and husbandry accounted for 48.4% and 44.5% respectively. The trend shows that the gross output value of husbandry will soon surpass that of crop production, and China's agriculture will be dominated by livestock production in terms of the value of gross output.

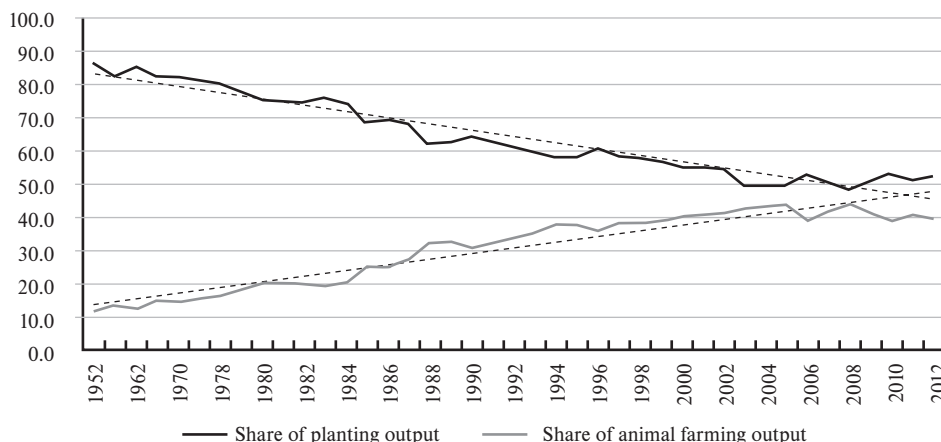


FIGURE 2. Changes in the share of China's crop production and livestock gross output value in total agricultural output

RYSUNEK 2. Zmiany w udziale produkcji roślinnej oraz produkcji zwierzęcej brutto w Chinach w całości produkcji rolnej

Source: NBS (compiled): China Statistical Yearbook (various years), China Statistics Press.

2.4 The Transition from Improving Land Productivity to Improving Labor Productivity

For thousands of years, China's agriculture has been characterized by the pursuit of higher land productivity. After 2000, given the rapid increase in agricultural labour costs, it is becoming more and more obvious that agricultural mechanization

is replacing a growing number of farm workers while at the same time, the multiple cropping index is dropping. Statistics show that land productivity and labour productivity annually grew at 0.62% and 4.10% respectively over the period of 1994–2002. These values increased significantly to 3.17% and 9.71% respectively for the period from 2003 to 2011. The shift in these figures reflects a shift to investments that allow increases in labour productivity.

2.5 China's Transition from an Exporter to an Importer of Agricultural Products

Over the period from 1953 to 1978, China's export value of agricultural products accounted for over 70% of China's total exports. Agricultural products were China's dominant international trade products and the main source of foreign exchange income, contributing positively to China's foreign trade growth.

TABLE 5. Basic information of China's international agricultural products trade

TABELA 5. Podstawowe dane na temat międzynarodowego handlu (import/eksport) produktami rolnymi w Chinach

| | Agricultural Trade (US\$ 100 million) | | | | Share (%) | | |
|------|---------------------------------------|--------------|--------------|------------------|-------------------|--------|--------|
| | Total value | Export value | Import value | Net export value | Import and export | Export | Import |
| 1980 | 105.9 | 62.4 | 43.5 | 18.9 | 27.8 | 34.4 | 21.7 |
| 1990 | 184.2 | 106.5 | 77.7 | 28.8 | 16.0 | 17.2 | 14.6 |
| 1997 | 248.9 | 149.3 | 99.6 | 49.7 | 7.7 | 8.2 | 7.0 |
| 1998 | 221.4 | 138.1 | 83.3 | 54.8 | 6.8 | 7.5 | 5.9 |
| 1999 | 216.3 | 134.7 | 81.6 | 53.1 | 6.0 | 6.9 | 4.9 |
| 2000 | 218.6 | 126.6 | 92 | 34.6 | 4.6 | 5.1 | 4.1 |
| 2001 | 279 | 160.7 | 113.8 | 46.9 | 5.5 | 6.0 | 4.7 |
| 2002 | 305.9 | 180.4 | 124.4 | 56 | 4.9 | 5.5 | 4.2 |
| 2003 | 403.6 | 214.3 | 189.3 | 25 | 4.7 | 4.9 | 4.6 |
| 2004 | 514.2 | 233.9 | 280.3 | -46.4 | 4.5 | 3.9 | 5.0 |
| 2005 | 562.9 | 275.8 | 287.1 | -11.3 | 4.0 | 3.6 | 4.4 |
| 2006 | 630.2 | 310.3 | 319.9 | -9.6 | 3.6 | 3.2 | 4.0 |
| 2007 | 781 | 370.1 | 410.9 | -40.8 | 3.6 | 3.0 | 4.3 |
| 2008 | 991.6 | 405 | 586.6 | -181.6 | 3.9 | 2.8 | 5.2 |
| 2009 | 921.3 | 395.9 | 525.5 | -129.6 | 4.2 | 3.3 | 5.2 |
| 2010 | 1219.6 | 494.1 | 725.5 | -231.4 | 4.1 | 3.1 | 5.2 |
| 2011 | 1556.2 | 607.5 | 948.7 | -341.2 | 4.3 | 3.2 | 5.4 |
| 2012 | 1757.7 | 632.9 | 1124.8 | -491.9 | 4.5 | 3.1 | 6.2 |
| 2013 | 1866.9 | 678.3 | 1188.7 | -510.4 | 4.5 | 3.5 | 5.4 |

Source: Ministry of Agriculture.

Note: Data for 1990 was adjusted from data of other sources due to some missing values.

The figures in Table 5 indicate that despite steady increases in gross value for combined imports and exports values, the value of exports, and import of agricultural products since 1980, the percentage share for trade in agricultural products relative to the growth of national trade declined over time. Agricultural trade as a percentage of total trade dropped to 4.5% for exports and imports combined, 3.5% for exports and 5.4% for imports (2013) from 27.8%, 34.4% and 21.7% respectively in 1980. After China's accession to the WTO in 2001, the absolute value of agricultural trade increased significantly. In 2002, the value of agricultural products traded internationally was US\$ 30.6 billion with a surplus of US\$ 5.6 billion establishing

a new record. Since 2004, trade in agricultural products have recorded a negative balance. The deficit reached US\$ 51.04 billion in 2013. This clearly indicates China is transitioning from a net exporter to a net importer of agricultural products.

Currently, exports of agricultural products are concentrated in such labour-intensive products as fresh water and marine seafood, horticultural crops and livestock products. These three product categories accounted for 65% of the total value of exported agricultural products, among which aquatic products accounted for 25%, fruits and vegetables for 23%, and livestock products for 17%.

Conversely Chinese agricultural imports typically are land-extensive commodities. Imported agricultural commodities such as grain and soybeans carries multiple benefits. First such imports give full play to China's comparative advantage in labour-intensive products and help increase farmers' incomes through market expansion. Secondly, the importation of such products helps to reduce pressures on arable land and fresh water resources. Thirdly, it limits the growth of the trade surplus and helps promote the international balance of payments. Importing agricultural products allows the use of lands and water resources of other countries. Provided that China had to produce all imported agricultural products for 2010, an estimate of 870 million mu (53.5 mln ha) of additional arable land would be needed, equivalent to 36% of China's actual sown area.

2.6 Promoting the Transition from Government Oversight to Participatory Management

2.6.1. Transition from the "Equal Number" Election System to Competitive Election System

Although democratic elections are legally required for the selection of village leaders, typically in the past the candidates were designated by local government officials, so that election results were largely symbolic given the lack of any explicit re-election system in place. Presently, candidates could be nominated by others or by themselves, and each one is supposed to deliver campaign speeches outlining their position on major issues. With reform, each voter should get a vote upon presenting their identity card, and will be allowed to cast their vote in a voting room, afterwards placing the ballot in a voting box. The result of the election will be declared in the form of an open roll. In addition, there is an established re-election system for village cadre elections as well.

In March, 1991, Ping'an Village, Shuanghe Township in Lishu County of Jilin Province, introduced a policy related to village committee direct election where all voters could nominate candidates. This was a "watershed" moment in the democratic election of village committee members. To date, democratic election of village leaders has been a regular practice in rural areas. Between December 1998 and January 1999, a new township leader was selected by the voters of Buyuan Township, Shizhong District, Suining City, Sichuan Province, the birth place of China's first directly-elected township leader. During this time, 300 townships across China adopted this approach. However, the practice was then suspended. It is likely that higher levels of direct election in more areas will appear with the deepening of reform after the 18th National Congress of the Communist Party of China.

2.6.2 Transition from Strengthening Control to Improving Governance in Rural Areas

Prior to the reforms, the emphasis for local officials was to control farmers' activities. Whatever the policy might be, including the resident registration system which prohibits farmers from leaving their homes, or the employment control system which requires farmers to take agriculture-related jobs, efforts were intended to control farmers' activities. The present emphasis is, however, on improving governance. Specifically, the new approach is intended to introduce revolutionary changes in the rural governance system through the implementation of the village resident autonomy system, to put democratic supervision into practice through disclosing village affairs and financial conditions, and to put democratic governance into practice through the replacement of the compulsory and accumulative work system dominated by village cadres with a more democratic "one project one discussion" system dominated by villagers.

2.6.3 Affecting the Transition from Management-oriented Government to Service-oriented Government

The major responsibility of local governments before the reform was management, putting government objectives into practice through different approaches, such as taxation, grain levies and family planning. Presently, the main responsibility is seen as the provision of services, to have farmers and their children educated by using compulsory education and training mechanisms, to provide farmers with access to medical services by using rural cooperative medical system, to help farmers overcome difficulties by using the minimum living security system, and to offer security to older residents through the implementation of the farmers' pension system.

III. ACHIEVEMENTS OF CHINA'S AGRICULTURAL TRANSITION

Centrally planned economies and market economies are two distinct systems with marked differences; a view shared by all. But there is considerable debate regarding the way the two systems might work together effectively. Generally speaking, a country believing the two systems could work together to some extent tends to take a gradual reform strategy; while a country with no tolerance for the opposite system might take a radical reform instead. Most scholars prior to 1989 took the view that the two systems could not work together, and promoted the radical strategy with reasons that while radical reform would have high, potentially destabilizing, immediate costs, but given a zero friction cost, the total cost would not be too much. Alternately, even though gradual reform has a low immediate costs and effects on society, the accumulated total reform cost would be high due to the long transitional period between the new and old systems. Even worse, the new system would not be able to evolve as it would be constantly constrained by the old system, so that the transition would go no nowhere. But ultimately, China took the less favored gradual reform strategy.

In most cases, countries adopting radical reforms failed to complete their economic transitions as expected within an expected period of time. China, adopting a gradual reform strategy has seen progressive steady development. In the short time frame of just over 30 years, China developed into a mid-income developing country from a low-income nation, and then took a further step up as an upper-middle income developing country while becoming the world's second largest economy. On the basis of comparative PPP, China's economy is expected to soon double in size.

In the next section, China's achievements in terms of this transition as it has developed in the agricultural sector will be summarized.

3.1 Stabilized Agricultural Growth

3.1.1 Faster Growth in Grain Output

1952 witnessed China's grain output reaching the highest level of pre-WWII (1936) years, and so the following analysis will take 1952 as the starting base line. From 1952 to 2012, China's grain output has increased from 160 million tonnes to 350 million tonnes in the first 30 years (1952-1982), an increase of 190 million tonnes; gross production grew further to 590 million tonnes from 350 million tonnes over the second 30 year period (1982-2012), an increase of 240 million tonnes, and a 50 million tonnes increase over the increase recorded during the first 30 years. Further analysis indicates that the grain output increases recorded during the first 30 years can be credited to the expansion of arable land stocks, and importantly on a productivity increase per unit arable land during the second 30 year period.

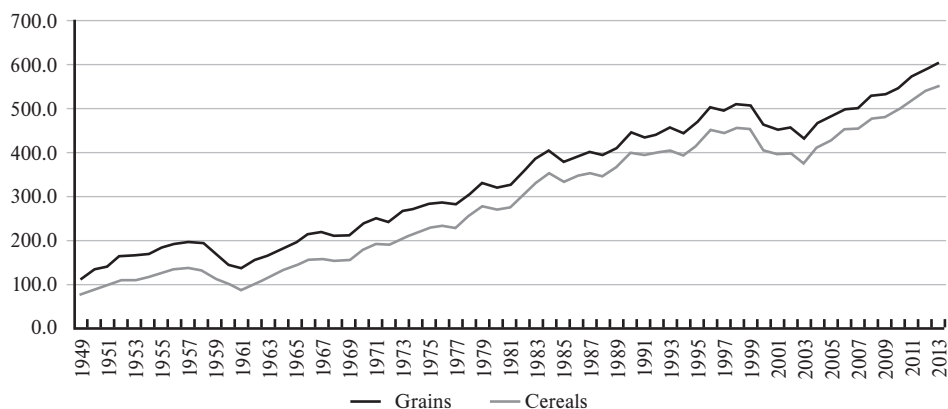


FIGURE 3. Changes in China's grain and cereal yields

RYSUNEK 3. Zmiany w plonach ziarna i zbóż w Chinach

Source: NBS (compiled): China Statistical Yearbook (various years), China Statistics Press.

3.1.2 Steady Growth of Other Agricultural Products

At the beginning of the reforms, China experienced rapid agricultural production growth. By the late 1990s, the country had an aggregate balance with occasional surplus in good years. Slowdowns have occurred with major agricultural products since then, but total production was much more stable than in the past (see Figure 4).

3.1.3 Stabilized Growth of Major Agricultural Products Per Capita

The combination of faster grain production increases and slower population growth brought China's per capita grain production to 433.5 kg in 2012, 116.4 kg and 69.3 kg more than that of 1978 and 2000 respectively. At the same time, per capita production of pork, beef and mutton were 45.5 kg and 17 kg more than that in 1978 and 2000 respectively. For seafood and aquaculture products, per capita output was 38.7 kg and 14.2 kg greater; per capita milk output was 27.7 kg and 21.1 kg more, per capita oil production was 20.2 kg and 2.3 kg more; and per capita cotton production was higher by 2.8 kg and 1.6 kg.

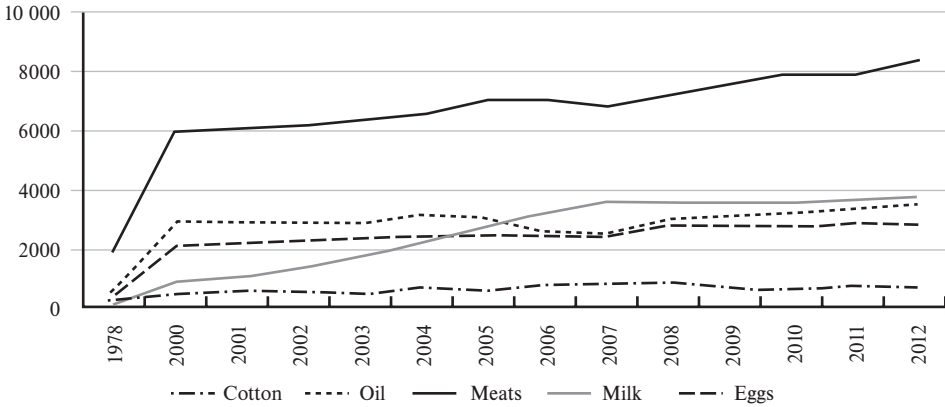


FIGURE 4. Growth trends of other major agricultural products since 2000

RYSUNEK 4. Tendencje wzrostowe innych głównych produktów rolnych od 2000 r.

Source: NBS (compiled): China Statistical Yearbook (various years), China Statistics Press.

3.2 More Sufficient Non-agricultural Employment for Farmers

Turning to employment, Figure 5 shows that the number of migrant labors employed in non-agricultural sectors increased from 59.6 million in 1985 to 2.6261 billion by 2012. Figure 5 also reveals that the Global Financial Crisis imposed a negligible effect on employment of migrant labors.

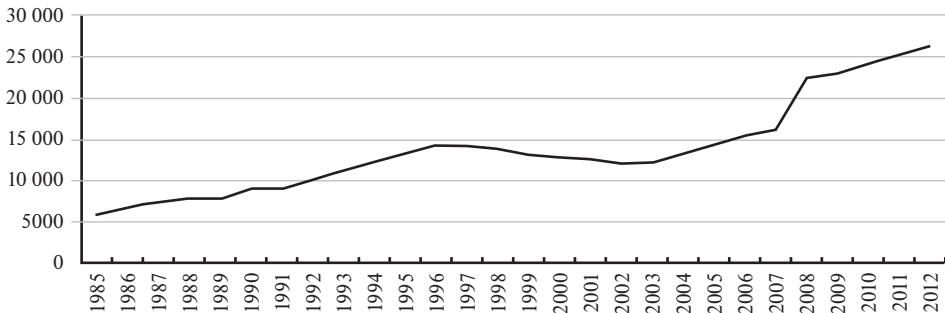


FIGURE 5. The number of migrant workers employed in non-agricultural sectors in China

RYSUNEK 5. Liczba pracowników migrujących zatrudnionych w sektorach pozarolniczych w Chinach

Source: Ministry of Agriculture.

With the expansion of migrant workers' employment opportunities, their contribution has extended from agriculture to non-agricultural sectors, and as importantly from rural to urban areas. Table 6 reveals that, during the period from 2008 to 2012, GDP created by migrant workers increased from 32.1% to 38.6% as compared to share of national total GDP, a 6.5% increase within four years. Given the fact that the salary of governmental agencies and public institutions does not create GDP, GDP created by migrant workers will eventually claim a bigger share in the national GDP.

TABLE 6. Changes in share of GDP created by migrant workers in the total of national GDP
TABELA 6. Zmiany udziału PKB wytwarzanego przez pracowników migrujących w całkowitym PKB kraju

| Year | Number of migrant workers (10,000) | Average monthly income of migrant workers (RMB /month) | Total salary of migrant workers (RMB 100 million) | GDP created by migrant workers (RMB 100 million) | National total GDP(RMB 100 million) | Share of GDP created by migrant labors against the total GDP (%) |
|------|------------------------------------|--|---|--|-------------------------------------|--|
| 2008 | 22542 | 1340 | 36247.5 | 100687.6 | 314045.4 | 32.1 |
| 2009 | 22978 | 1417 | 39071.8 | 108532.8 | 340902.8 | 31.8 |
| 2010 | 24223 | 1690 | 49124.2 | 136456.2 | 401512.8 | 34.0 |
| 2011 | 25278 | 2049 | 62153.5 | 172648.7 | 472881.6 | 36.5 |
| 2012 | 26261 | 2290 | 72165.2 | 200459.0 | 519322.0 | 38.6 |

Source: Monitoring Survey Reports on Migrant Workers issued by National Bureau of Statistics in recent years.

Note: In China, salaries account for about 36% of total GDP according to the China Statistical Yearbook, which is why we use 36% to calculate GDP created by migrant workers.

Figure 6 shows that China's urbanization rate increased from 15.39% to 17.92% from 1957 to 1978, an average annual rate of growth of 1.2%; it further increased to 30.89% from 17.92% from 1978 to 1999, an average annual rate of 0.62%; and it then climbed to 53.37% from 36.22% from 2000 to 2013, an average annual rate of 1.32%. This urbanization rate reflects an obvious acceleration. One of the most powerful driving forces in pushing this process forward is the employment of hundreds of millions of migrant workers in China's cities.

3.3 Better Social Benefits for Farmers

From 1978 to 2012, farmers' per capita income increased from RMB 133.6 to RMB 7,917. Calculated with comparable (constant) prices, this reflects a 10.77-fold increase. In addition, farmers enjoy much better social benefits.

Great progress, firstly, has been made with respect to compulsory education. China kicked off its compulsory education I program in 2006. It was promoted across China in 2007. Funding provided by the government, costs otherwise born by the farmers, is about RMB 230 billion

Secondly, a new rural cooperative medical system has been implemented. In 2003, the new rural cooperative medical system was promoted rapidly and covered all rural residents by 2008. In the beginning, RMB 30 was provided for each individual per year, including RMB 20 that was subsidized by governments at all levels. These funds were increased to RMB 410 per person per year in 2014, with RMB 90 provided by the farmer covered and RMB 320 subsidized by governments

of all levels. Farmers covered will be reimbursed for up to 75% for hospitalization, with an annual accumulated reimbursement amount of RMB 80,000 to RMB 150,000 (different provinces might have different reimbursement “caps”). Treatment of 20 major diseases such as children congenital heart disease is not covered by this policy and so reimbursement subsidies are calculated separately.

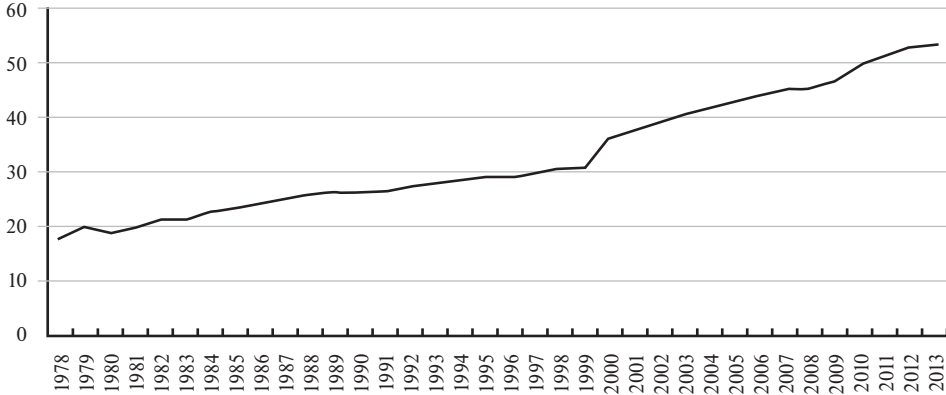


FIGURE 6. Changes in China's urbanization rate since the introduction of reforms (%)
 RYSUNEK 6. Zmiany w tempie urbanizacji Chin od momentu wdrożenia reform (%)

Source: NBS (compiled): China Statistical Yearbook (various years), China Statistics Press.

Thirdly, infrastructure supply equalization has been carried out in the following areas. (1) Safe drinking water supplies for farmers. This work has been fully completed. (2) Power supply for production and household use in rural areas. The objective to supply rural and urban areas with the same power grid at same price has been realized. (3) Rural roads. Objectives such as road connection, road width (3.5 meters or above for township roads and 3.0 meters or above for village roads to ensure all weather connection), road surface hardening and passenger transportation have been realized. (4) Improvements related to quality of life have also been carried out. Communication services such as postal services, broadcast access for television, and telephone and internet connections have all been provided.

Fourthly, a “rural residents” minimum living security system’ has been established. China started testing the rural minimum living security system in selected provinces in 1996, and promoted it across rural areas nationwide in 2007. As of 2014, rural residents enjoy a minimum living security of RMB 180 to 450 per person per month (depending on living costs and financial conditions found in different areas).

Fifthly, a social pension scheme for rural residents has been initiated. During the period from 2006 to 2010, the Government once again started to push forward the new rural residents’ social pension scheme to provide financial security for people aged above 60. By 2011, over 326 million rural residents have participated in this program, with 85.25 million receiving benefits.

IV. LESSONS LEARNED FROM CHINA'S AGRICULTURAL TRANSITION

Radical reforms in China are generally led and promoted by new leaders. The reason for them to adopt radical reforms and reject previous systems are two-fold: to reverse a sluggish national economy, and to win support of the people. The first generational leaders of China's reform were promoters of the planned economy. On one hand, leadership wished to get rid of the multiple shortcomings of the planned economy; on the other hand, they were reluctant to entirely deny the planned economy as well. This is an important reason why China adopted an gradual reform strategy and focused on fixing problems associated with the planned economy rather than giving it up completely.

Chinese culture embraces the qualities of stability and pragmatism. From the "the doctrine of the mean" of Taoism, to Mao Zedong's "being realistic and down-to-earth", Deng Xiaoping's "emancipating the mind", Jiang Zemin and Hu Jintao's "keeping up with the times", and Xi Jinping's "empty talks jeopardizing national interests", all of these concepts share the same cultural origins. In contrast to radical thoughts, "the doctrine of the mean" advocates a gradual progress; "Being realistic", "emancipating the mind", "keeping up with the times" and "empty talks jeopardizing national interests" advocate a cultural imitativeness in forming new ideas according to practical development without being constrained by cultural traditions, in response to dogmatism and empiricism.

4.1 Adhering to the Reform's Gradual Progressive Nature that Builds on "small wins" and grows into a "final victory"

China has adopted a gradual progressive reform strategy which is built on small successes that collectively lead to a final victory. To be specific, the strategy starts by addressing problems associated with the weakest links of the national economy, to ensure a minimized loss during reform and to deepen the reform when small tests succeed until a top level goal is achieved step by step. Taking the household responsibility systems an example, the policy was tested among 20% of the worst performing production teams, then promoted to the mid-low 30% when the test succeeded, then the upper-middle 30%, the best 15%, and then finally the top 4%, step by step. For those rural communities that haven't adopted the household responsibility system, exceptions have been allowed.

The same progressive strategy also applies to the contract duration of the household responsibility system. In the beginning, contracts covered only one to three years. In 1984, in order to encourage farmers to care for, and invest in their land, the contract length was prolonged to 15 years. The length of contract was further extended to 30 years in 1994.

4.2 Adhering to the Reform's Pareto-Improvement Nature or Kaldor-Improvement Nature

China's reform strategy has had no losers, only beneficiaries. The initial household responsibility system is a typical reform that benefits all and hurts no one.

Reforms of this kind represent Pareto-improvement in nature. However, with the deepening of the reform, agricultural reform loses the nature of Pareto-outcome improvement. Examples include personnel streamlining during on-going reforms of rural institutions, and some reform measures taken with an aim to protecting the ecological environment such as returning farmland to forestry, returning grazing areas to grassland, and returning farmland to a natural state for lake and forest protection. In response to these situations, the Government introduced economic compensation policies such as service length compensation and post compensation responding to the former, and an ecological compensation system for the latter, to assure the reforms are now characterized by Kaldor-outcome improvements.

4.3 Adhering to the Reform's Market Orientation

China's agricultural reform has been market oriented from the very beginning. Priority at the beginning was to loosen control on agricultural product markets, and then turn the focus to improvements to factor markets, so as to give full play to the decisive role of market mechanisms in agricultural resource allocation. Among these, the labor market is currently the most developed, followed by the land management rights circulation market, with the capital market lagging behind. A positive sign is the fact that recently, the rural capital market has been improving, and it is certain that the development of the rural factor market will see a new peak, fueled by the powerful push from the decisions on further deepening reform at the 3rd Plenary Session of the 18th Central Committee of the CPC.

4.4 Adhering to the Fundamentals of the Reforms

China's developmental approach is unique to China. It is not predicated on models from other nations. The architects of China's agricultural reform not only value local experiments made by farmers, but also the promotion of replicable experiences and lessons learned. There are many examples of this including the household responsibility system, township and village enterprise development, programs that allowed urban-rural migration and the local election system. In cases where local experimentation proves unsuccessful, the Government will help farmers fix and solve resulting problems. As all the practices are from China's own experience, rather than copied from other countries, they have a noticeable indigenous feature.

Further, the leaders of China's agricultural reform also value "win-win" results and all farmers are winners, although it is true some have benefitted more than others. This is an important reason that China's on-going program of rural reform is broadly supported by farmers.

Introducing competition and market mechanisms is essential for China's continued success. China's agricultural reform focuses on improving farmers' enthusiasm for production, starting from implementing the "more pay for more work" system and continuing through many other programs. Of course, there remains a gap between farmer's incomes from place to place but this is largely the combined result of differences in competency among farmers and regional differences in resources and access to markets, rather than institutional differences.

4.5 Agricultural Development Exerts Greater Pressure on Natural Resources and Environments

China's grain yields have increased steadily for ten straight years, and other major agricultural products also recorded significant improvements in yields as well. These improvements have laid a solid foundation for economic and social development, but, it must be recognized that the greater the intensification of agricultural production systems, the greater the strain on natural resources.

China faces severe constraints with respect to land and water resources. The nation's per capita arable land supply is 1.38 mu, only 40% of the world average. With the continuous growth of population and occupation of arable lands due to increased industrialization and urbanization, arable land per capita will drop further. After agricultural development of thousands of years, backup arable land resources are getting more limited and harder to develop. China's per capita available water is 2,100 cubic meters, only 28% of the world average. With increased water demands for industrial, urban and ecological purposes, shortages of water for agricultural usage are getting worse. Considering the issue from a spatial perspective, northern China claims only 9% of the national water supply but has 60% of the national total arable land. Agriculture is suffering from water resource shortages.

There are also environmental capacity constraints. Presently, China's unit area fertilizer usage is twice that of the upper limit set by FAO, and pesticide use is 2.5 times of the world average. According to the *Environmental Bulletin 2010* published by the Ministry of Environmental Protection, rural non-point source pollution has exceeded urban industrial pollution, and rural areas now account for 43% of the total COD, 57% of the total nitrogen and 67% of the total phosphorous released to the environment. The above three issues require serious and immediate attention.

V. CONCLUSIONS

Any developing country could have chances to develop its economy at a speed faster than developed countries in order to become a developed nation. To achieve this goal, it must make full use of comparative advantages and late-starting advantages. Nations that make full use of comparative advantages will enjoy late-starting advantages, and will be rewarded with faster technological change so as to catch up to developed countries.

While "shock therapy" seems highly logical and is closely intertwined with all its links based on theoretical models, it fails due to the advocator's ignorance of distortions arising from efforts to satisfy needs of multiple groups and interests, and neglects the objective reality that priority industries in these economies have no viability due to lack of comparative advantages, and will not be able to survive when no protection and/or subsidy measures are taken.

While the incremental reform strategy was less favored in China at the beginning of the reform era, countries adopting this strategy succeeded. To put it simply, first, businesses with no viability continue to be protected in the transition process, so they will not collapse; second, with the improvement of micro actors' enthusiasm, more

and more resources flow to sectors with comparative advantages, which enables economy to develop dynamically. This is an important reason why China had a relative successful transition.

In China, a developing country with a huge farming population, its agricultural sector not only demonstrates how these policies can be successful, but also plays a special important role in China's transition towards equity and sustainable development.

REFERENCES

- Department of Agriculture Policy and Law, Ministry of Agriculture (compiled), *40 Years of China's Countryside*. Central Peasants Publishing 1989, pp. 30–132.
- Justin Yifu Lin, 1992: Rural Reforms and Agricultural Growth in China. *American Economic Review*, Vol.82, Issue 1, pp. 34–51.
- Li Zhou, 2014: Achievements and Challenges in China's Rural Development. *China Economist* No. 5, pp. 82–93.
- Li Zhou, Haipeng Zhang, 2013: Productivity Growth in China's Agriculture During 1985–2010. *Journal of Integrative Agriculture* 12: 1896–1904.
- Xu, Qing, Rong Yin, and Zhanghui Liang, 2011: Economies of Scale, Return to Scale and Moderate Size of Agricultural Operation – Empirical Study Based on China's Grain Production. *Economic Research* No.3. (Sociology Edition, No.6).
- Zhang, Jun, Zhihao Tan, Wenjuan Li, Fei You, Wenbo Zhang, Wei Zhang, and Min Cheng, 2011: Research on China's Grain Production Development and Spatial Distribution Evolution between 1949 and 2009. *China Agricultural Science Bulletin*, No.24.

PRZEMIANY W CHIŃSKIM ROLNICTWIE: DOŚWIADCZENIA I WNIOSKI

Streszczenie: Rozwój rolnictwa od początku epoki reform grał kluczową rolę w przemianach gospodarczych w Chinach. Po pierwsze, reformy rolnicze wprowadzone w okresie systemu odpowiedzialności kontraktowej znacznie zwiększyły zbiory i wydajność rolnictwa, a przy tym wyprowadziły setki milionów rolników ze skrajnego ubóstwa. Po drugie, olbrzymi przepływ siły roboczej z terenów wiejskich do miejskich, spowodowany zarówno zwiększeniem produktywności rolnictwa, jak i reformami politycznymi w kwestii mobilności pracowniczej, również przyczynił się do znaczącego wzrostu gospodarczego. Powyższe przemiany w obrębie zasobów pracy są ważnym składnikiem sukcesów Chin zarówno w zakresie urbanizacji, jak i industrializacji. Po trzecie rozwój rolnictwa, prowadzący do zwiększenia produkcji brutto, jak również poprawy wydajności produkcji, pozwolił Chinom skutecznie radzić sobie z wyzwaniem żywienia 1/5 ludności świata dysponując zaledwie 7% gruntów rolnych na świecie. Niniejszy artykuł podsumowuje historię przemian w chińskim rolnictwie, przybliża ich największe osiągnięcia i analizuje płynące z nich wnioski.