

# An Empirical Study on Modern Agriculture, Rural Development in China and Future Prospects

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**Abstract**— The main objective of this paper is to determine and shows the modern agriculture and rural development in China and future prospects. In 1978 China introduced economic reforms and has become the manufacturing hub of the world, where its secondary sector including comprising industry and construction represented the major share of gross domestic product GDP. But in recent years, modernization of China pushed the tertiary sector and, in 2013, it became the largest category of gross domestic product (GDP) with a share of 46.2%, while the secondary sector still accounted for a generous 45.0% of the country's total output. The grain output of China reached 571.2 million tons in 2011, 140.5 million tons more than the output in 2003. Major agricultural products, technologies and equipment have also increased.

**Index Terms**— Modern Agriculture; Gross Domestic Product; Rural Development; Manufacturing and Future Prospects

## 1 INTRODUCTION

CHINA has a massive topography territory, it has five climate zones from the south to the north and gradually rises from the east to the west like a three-step staircase, thus producing unique topographic features and diversified climatic conditions. With accelerating urbanization and industrialization since 1980s, agriculture takes up lesser and lesser share in the GNP, but its role as the base and staunch pillar of the national economy has never changed. By using merely about 9% of the world's cultivated land, China has not only managed to meet the demand of 1.328 billion people for grain and other agro-products, but also been able to provide raw materials, labors and a huge consumer market for industries, services and other sectors. In 2008, agriculture (in terms of added value) took up a share of 11.3% of the GDP and 36.6% of employment. It plays increasingly important roles in produce supply, food safety, and environment protection, as its multi-functionality fosters.

In 2008, there were about 256.6 million farm households, and 520.3 million farmers in the workforce in rural areas (54.5% in farming and 45.5% in industry and service sectors) in China. Since 2001, the Chinese government has been promoting the transformation of production and management practices and helping farmers to be better organized. Now there are over 150,000 farmer cooperatives with more than 38.7 million members (7.2 times of 2002), which include 34.8 million household members, representing 13.8% of the total number of households. Vertical integration in agriculture is blossoming. By the end of 2007, there were 172,000 agribusiness bodies, which leveraged an average income increment of 1,649 Yuan to each of the 95.11 million households who were involved in the integration.

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## 2 LITERATURE REVIEW

Schultz (1953) [1] pointed out; there are two stages in agricultural development: the Food Problem in developing countries and the Farm Problem in developed countries. Hayami and Godo (2002) [2] also added another Poverty Problem in middle-income countries. In developing countries, food is always not enough to satisfy the demand due to low yields, which may cause high food prices and impede economic growth in non-agricultural sectors, as is happening in current Africa.

The income of farmers in China has been growing very fast so far. It has changed the livelihoods of a lot of poor farmers. The poverty rate in rural China has been substantively decreasing in the past three decades (Fan, Zhang and Zhang, 2004) [3].

The nominal net income for farmers increased from 133.57 yuan in 1978 to 2622.20 yuan in 2003, and increased to about 20 times in 25 years. When considering the inflation, the net income also increased by more than 4 times. The poverty population and the poverty rate, respectively, decreased from 250 million and 30.7% in 1978 to 23.6 million and 2.5% in 2005. The economic growth in rural China does not only change the poverty figure in China, but also changed the poverty map of the world (World Bank, 2008) [4].

Watanabe (1996), Qiao et al. (2003), Hayami and Godo (2005), and Byerlee (1987) pointed out that fertilizer is crucial for the Green Revolution. Modern varieties of rice and wheat have semi-dwarf characteristics, with short and stout stems for sustaining heavier grain yields and with pointed leaves for better reception of solar radiation. Higher yields can be achieved by higher levels of fertilizer inputs. The statistics show the correlation between grain yields and chemical fertilizer utilization in China are very high after 1950 [5], [6], [7], [8].

Fan and Pardy (1997) [9] also find that the contribution of irrigation to agriculture growth before the Economic Reform in 1978 is about 9%, and the contribution after 1978 is almost

nothing. Irrigational land usually has higher yields than dry land. In the era of the Planned Economy, China input a lot of manpower to develop a good irrigational system, which contributed a lot to Chinese agriculture growth, even after the 1978 Economic Reform.

Fan (1991) [10] also uses the provincial data to compute the technical efficiency from 1965 to 1985, and finds that the technical efficiency increased from 0.646 in 1965 to 0.843 in 1985. Liu and Zhuang (2000) [11] use a survey data for more than 7000 farmers in 1990 from Sichuan Province and Jiangsu Province, and find that the technical efficiencies are 55% and 77% for Sichuan and Jiangsu Provinces, respectively. Also, education is statistically significant for explaining the differences in technical efficiencies in both provinces. Wang, Cramer and Wails (1996) [12] find that average profit efficiency of farmers in 1991 is only 0.62, and education, family size and per capita net income are positively correlated with and statistically significant for the profit efficiency.

The rural non-farm sector—comprising, for example, home production of clothing as well as wage employment in rural factories—is heterogeneous. Of particular interest when studying this sector is the emergence of rural towns. As they offer a larger market compared with rural settlements, they allow rural enterprises to benefit from economies of scale and higher profits (Hazell and Haggblade 1993) [13]. Empirical evidence suggests that such towns have the potential to generate economic growth. China's Township and Village Enterprises are a leading example of this phenomenon (Lanjouw and Lanjouw 1995) [14].

Barrett et al. (2001) name four main causes for income diversification into non-agricultural activities: seasonality in employment opportunities, diminishing returns to factors of production, market failures and risk management. Rural non-farm employment is not an option for all rural households. Zezza et al. (2008), using survey data from 15 developing countries, identify patterns along demographic characteristics as well as asset possession of households by income source. They conclude that households are more likely to engage in on-farm work if they own land, have lower levels of education, have little access to infrastructure and a greater share of their labor force members is female.

### 3 CURRENT AGRICULTURAL GROWTH AND FUTURE PERSPECTIVES

From 1978 to 2013, Economists estimate that the Gross domestic product (GDP) of China at between 9.5% to around 11.6% a year. The GDP has risen tenfold in the beginning of Deng Xiaoping's reforms. The total factor productivity (TFP) which is most important factor was increased with productivity accounting for 40.1% of the gross domestic product (GDP) increased and compared with a decline of 13.2% for the period 1957 to 1978. During the period 1978–2005, gross domestic product GDP per capita of China increased from 2.7% to 15.7%. Per capita incomes grew at 6.6% a year and average wages raised six fold between 1978 and 2005, while absolute

poverty declined from 41% of the population to 5% from 1978 to 2001. Some studies show that the economic growth of China has been inconspicuous, due to huge sectors of the economy not being counted. The real annual gross domestic product (GDP) growth rate in % from 1952 to 2015 is showed in figure 1.

### 3.1 FUTURE PROSPECTS

In future, China will be in a stage of enhanced industrialization, marketization and internationalization, urbanization, and sustainable socioeconomic. China will continue to put the issue of agriculture, rural areas and farmers as the top priority and growth will require stronger support from agriculture. It will continue to fortify agriculture as the economic basis, and encourage integrated urban and rural socioeconomic development.

#### 3.1.1 Improvement in Production

China will promote the stable development of grain production, and enhancing the productivity of main grain production areas, improving yield, superiority and efficiency. The production of grain is sustained over 500 million tons in 2010, and will increase to reach over 540 million tons in 2020. Major products production will maintain a stable increase. In 2010, the output of cotton, oilseeds and sugar bearing and other crops reached 6.8 million, 32 million and 120 million tons respectively. The production of egg, milk, meat and aquatic products reached to 85 million, 30 million, 42 million and 60 million tons respectively.

#### 3.1.2 Restructuring of Agriculture

In 2010, geographical concentration of agricultural production improved further and the competitive production belts was shaped. The mix product of agricultural sectors further optimized, with livestock industry accounting for 55 % of the total agricultural production value. In future, rural sectoral structure will be better coordinated to have fast growing second and tertiary industries, and the ratio of agricultural product will increase.

#### 3.1.3 Strengthen Agricultural Service System

In future, agricultural service system in China will improve related to extension, epizootic prevention and plant protection, product quality & safety. The total horsepower of farm machinery will increase more than 900 million kilowatt, and specialized cooperative economic organizations will leverage more than 30% farming households into their business activities.

#### 3.1.4 Improvement in Rural Distribution System

China will upgrade wholesale markets, rate products into several quality grades and promote standard-based packaging. Village market project will be implemented to encourage retailers to open stores in more townships and villages, reform the network of supply and marketing cooperatives and encourage the outreach of urban commercial network to rural areas.

### 3.1.5 Increment of Farmer's Income

Income of farmers will be increased in 2020; China will develop competitive products that have superior quality and high added value. It will promote the innovative mechanism and restructuring of township enterprises, stabilize inputs price, and develop an agricultural support system.

### 3.1.6 Cultivating New Farmers

It will promote education, training, skills and cultural activities in rural areas. New farmers will be cultivated by education, skills and rural education facilities will be improved. It will support the training of new farmers to improve their farm skills and conduct the practical hand training project to produce teams of practical hands in farming, construction, business, science and other sectors.

### 3.1.7 Increasing Investment for Rural Development

China will increase the investment for the development of rural areas and formulate a long lasting mechanism of letting industry promoting agriculture. It will improve the distribution of income, continuously increase investment in agriculture and countryside from national budget.

## 4 CONCLUSION

China has continued to take increasing rural incomes as the top priority in work relating to rural areas, and have completed every effort to create more ways to increase rural income. The per capita net rural income is increasing steadily over the past several years, is expected to exceed 6,900 yuan in 2011. This will be a significant increase of more than 4,400 yuan over that of 2002. The living standards of the rural population have particularly improved and are continuing to improve.

As a result, compulsory education is freely available to 130 million rural students; and a new rural cooperative medical care system covers 97% of the rural population, and over 53 million rural residents have access to basic living allowances. Progression has been made in the development of community organizations and in enhancing democracy and the rule of law in rural areas.

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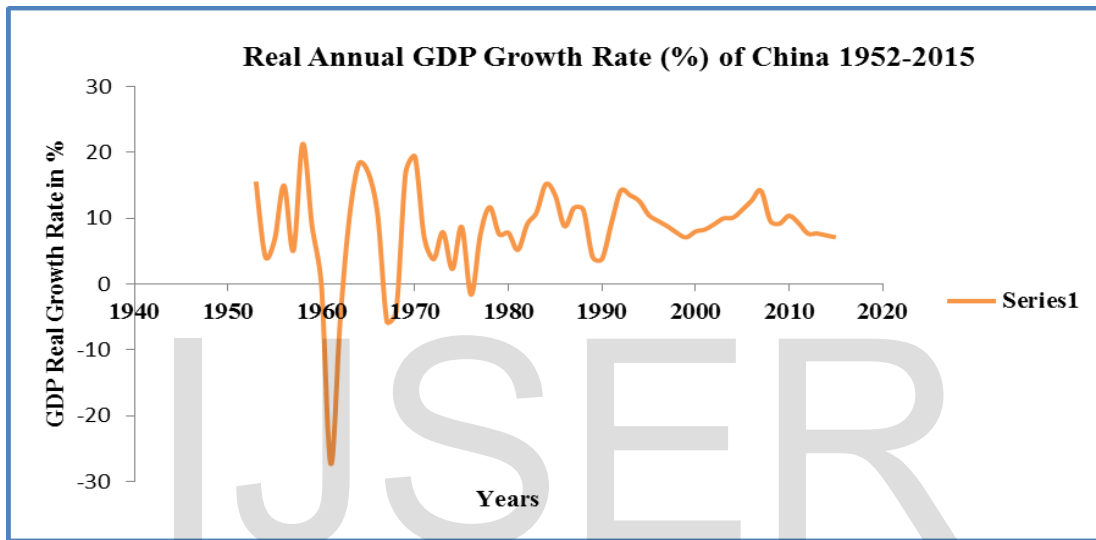


Figure 1