

The Development of the American Family Farms and the Enlightenment to China -- Based on data from the Four the U.S. Agricultural Censuses from 1997 to 2012

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ABSTRACT

Based on the data of four agricultural census of the United States from 1997 to 2012 and relevant data, this paper has summarized the development and the status quo of the American farms. According to the reality of china's agricultural development, some suggestions are put forward. First, giving priority to cultivate and develop large-scale business entities. Second, perfecting agricultural socialized service system actively, and fostering subsequent forces agricultural field.

On September 26, 2018, the CPC Central Committee and the State Council issued the Strategic Plan for Rural Revitalization (2018-2022), which set out the relevant development requirements of "establishing a modern agricultural operation system, strengthening new types of agricultural operation entities, and facilitating the organic connection between the production of small farmers and the development of modern agriculture". As a new type of main business entity in China, family farm has been developing rapidly. By the end of 2012, China had 877,000 family farms with 176 million mu of cultivated land managed, accounting for 13.4 % of the country's contracted arable land. On the whole, however, family farms are still in the initial stage of exploration and development, and many aspects still need to be further improved. This paper summarizes the development of American family farms by using the data of the US agricultural Census from 1997 to 2012, the annual statistics of the US agriculture in 2017 and other relevant data, and

analyzes the enlightenment of the US experience to China based on the actual situation of China, so as to provide references for the development of Chinese family farms.

Keywords— Agricultural Censuses, Farms, United States, China, Population, Rural, Urban

I. INTRODUCTION

Agricultural Modernization in the United States

As the most developed country in the world, the national income per capita of the US exceeded 10,000 RMB in 1978, up to \$10,790, and exceeded \$50,000 in 2011. It reached \$58,270 in 2017. As the largest developing country in the world, China's national income per capita in 2017 did not exceed \$10,000, accounting for \$8,690, and it is listed as a middle-income country in the World Bank's annual development report. From the perspective of industrial structure, over the past two decades, the proportion of agriculture in the three major industries in the United States has remained stable at around 1.5%. In 2017, the U.S. primary industry contributed 1.2 percent of its gross domestic product, and China accounted for 7.9%.

Table 1: Changes in output value of agriculture, forestry and fishery in the United States from 1997 to 2017

year	GDP (millions)	Agriculture, Forestry and Fisheries (million)	Proportion (%)
1997	15355.4	257.8	1.7
2002	19175	241.3	1.3
2007	26151.3	346.9	1.3
2012	28663.2	447.3	1.6

2017	33708.4	421.3	1.2
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Data source: Bureau of Economic Analysis

From the perspective of agricultural population and agricultural employment population, from 1997 to 2017, the proportion of rural population in the United States had been continuously decreasing, from 22.2% in 1997 to 18.4% in 2017, and the urbanization level had been gradually improved. According to the data of the 2017

International Statistical Yearbook, the employment of the primary industry in the United States accounted for 1.6% of the total employed population in 2015, and 1.8% in 2000, indicating that the United States is in a stable stage of urbanization.

Table 2: The change of rural Population in the United States from 1997 to 2017

year	1997	2002	2007	2012	2017
Total population (1000)	272136	287506	300595	313335	324459
Rural population (1000)	60390	59770	59939	59982	59579
Accounted for	22.2%	20.8%	19.9%	19.1%	18.4%

Data source: FAO

II. THE DEVELOPMENT OF FAMILY FARMS IN AMERICA

The United States is the most developed agricultural country in the world, and the family farm is its basic organization carrier. In 1862, the United States amended and implemented the Homestead Law, which ensured that private land rights could be traded in accordance with the corresponding law, and "cultivators have their land" that was realized, thus the family farm system was established in American agriculture. Since the

1930s, due to the impact of the economic crisis and the Second World War, the supply of agriculture in the United States has exceeded its demand, and the American government has implemented a production planning system for agriculture. In 1973, the federal government enacted the Agriculture and Consumer Protection Act, which explicitly abolished yield plans and area limits so that farmers could produce according to their own production plans, which laid the foundation for large-scale operation of family farms.

2.1 The Number and Scale of Family Farms

Table 3: Number and size of family farms in the United States

year	1997	2002	2007	2012	2016
Total number of Farms (10,000)	221.6	212.9	220.5	210.9	206
Total farm area (acres)	932 million	938 million	922 million	914 million	/
Size of land per farm (acres)	430.9	440.7	418.2	433.6	442

Data source: U.S. Agricultural Statistics Report

The share of the America's rural population has been declining, while the total number and total area of family farms has been shrinking. The total number of farms fell from 2.216 million in 1997 to 2.06 million in 2016, and the total number of farms fell from 932 million acres in

1997 to 9.14 billion acres in 2012. The average size of land per farm has increased slightly. The average size of farm land in the US was 430.9 acres in 1997, increased to 440.7 acres in 2002, fell to 418.2 acres in 2007, and rose back to 433.6 acres in 2012.

Table 4: Distribution of the number of farms at different land scales

Land size (acres)	1997	2002	2007	2012
1-9	9.3%	8.4%	10.6%	10.6%
10-49	24.0%	26.5%	28.1%	27.9%
50-179	31.3%	30.9%	30.0%	30.1%
180-499	19.3%	18.3%	16.7%	16.4%
500-999	8.1%	7.6%	6.8%	6.8%
1000-1999	4.6%	4.7%	4.2%	4.3%
2000 or more	3.4%	3.7%	3.6%	3.9%

Data source: U.S. Agricultural Statistics Report

Zhang Shiyun et al. (2014) used the data of the United States from 1900 to 2010 and divided it into four stages according to the characteristics of the number of farms and the average size of farms. The period from 1992 to now is the fourth stage, indicating that the United States has entered into a period of stable development, and the proportion of the number of farms in the total number of farms in different land sizes has little change. According to the statistical data from 1997-2012 in the above table, some phenomena can still be explained. The number of small-scale farms with less than 49 acres and large-scale farms

with more than 2,000 acres is on the rise. In 1997, the number of large-scale farms with less than 49 acres accounted for 33.3% of the total number of farms. In 2017, the proportion of large-scale farms rose to 38.5%.The number of large-scale acres or more rose from 3.4 percent in 1997 to 3.9 percent in 2012.On the other hand, the number of medium-sized farms is decreasing. The proportion of farms of 180-499 mu dropped from 19.3% in 1997 to 16.4% in 2012, and the proportion of 500-999 mudeclined from 8.1% in 1997 to 6.8% in 2012.

2.2 Benefits of Scale Farmers

Table 5: Income from farms of different sizes in the United States

Gross agricultural income (untaxed)	1997 (pieces)	Total output value (in thousands of US dollars)	2002 (pieces)	Total output value (in thousands of US dollars)	Year 2007 (unit)	Total output value (in thousands of US dollars)	2012 (pieces)	Total output value (in thousands of US dollars)
\$1 - \$999	248517	79874	227619	80006	202035	74061	224718	77312
\$1000 - \$4999	197770	466754	197319	471843	207733	508874	225962	555749
\$5000 - \$9999	67776	460993	73960	513788	89353	627048	97776	683526
\$10000 - \$24999	61177	908276	71413	1101514	97998	1542249	113287	1793765
\$25000 - \$49999	16989	566973	29784	1019940	49568	1722636	64308	2258476
More than \$50000,	9661	1052070	21831	2672136	46500	6015006	84904	13153778

Data source: the U.S. Agricultural Statistics Report

The farm management pursues the moderate scale, expands the land scale to reduce the production cost at the same time, and raises the farm income relatively. Except that the number of small family farms with an annual income of less than \$999 is gradually declining, the number of family farms with an annual income of more than \$999 is increasing year by year, especially the number of family farms with an annual income of \$25,000. In 1997, the number of farms with annual income between \$25,000 and \$49,999 was 16,989, accounting for 0.76% of the total

number of farms in that year. In 2012, the number increased to 64,308, accounting for 3.03% of the total number of farms in that year. In 1997, the number of farms with annual income of \$50,000 was 9,661, accounting for 0.43% of the total number of farms in that year. In 2012, it increased to 84,904, accounting for 4.03% of the total number of farms in that year, an increase of 10 times. In recent years, American family farms have been expanding production scale and pursuing economies of scale.

2.3 Part-Time Employment of Family Farms

Table 6: American family farmers employed in non-agricultural work

year	1997	2002	2007	2012
The percentage of farms on which family farmers have no off-farm work	37.6%	45.2%	35.3%	39.0%
The percentage of farms on which family farmers have off-farm work	56.6%	54.8%	64.7%	61.0%

Data source: the U.S. Agricultural Statistics Report

Based on whether the family farmer has off-farm work or not, farms can be divided into farms where the farmer has no off-farm work and farms where the family farmer has off-farm work. From 1997 to 2012, the number of farms without off-farm work and those with off-farm work for family farmers accounted for about 40% and 60%,

respectively. In 2012, family farmers without off-farm work accounted for 39.0% of the total number of farms in the United States, and 61.0% with off-farm work of the total number of farms. It can be seen that the degree of part-time farming in the United States is higher.

2.4 Aging of Family Farmers

Table 7: Age of American family farmers

year	2007	Percentage	2012	Percentage
under 25years old	5988	0.6%	6018	0.6%
25 to 34 years old	44591	4.5%	49376	4.9%
35 and 44years old	97508	9.8%	82877	8.2%
45-49 years old	94177	9.5%	71007	7.0%
50-54 years old	116862	11.8%	111294	11.0%
55 to 59years old	125892	12.7%	130792	13.0%
60-64 years old	134164	13.5%	146371	14.5%
65-69years old	130683	13.1%	142219	14.1%
above 70 years old	244016	24.6%	267950	26.6%
total number	993881	100%	1007904	100%
Average age (years old)	59.2		60.2	

Data source: the U.S. Agricultural Statistics Report

III. CONCLUSIONS AND IMPLICATIONS

3.1 Conclusions

With the development of urbanization, the aging of the agricultural population has intensified. In 2007, the average year of farmer was 59.2 years old, and 51.2% of farmers were over 60 years old. In 2012, the average age of all farmers was 60.2 years old, and 55.2% of farmers were over 60 years old. The average age of farmers has risen by one year old, and the proportion of those over 60 years old has risen by four percentage points within five years, which indicates that more than half of America's farmers are over 60 years old, and a quarter of them are over 70 years old. Family farms confront with the reality of the aging problem of operators, and no one to take over. Eventually, it is possible exit market naturally.

3.2 Implications

1. It is reasonable to give priority to cultivate and develop medium and large scale operation entities. In the development process of American agriculture, the scale and structure of farms have been constantly adjusted. However, in the past 20 years, the number of farms with a land scale of 10 to 180 acres accounts for about 60% of the total number of farms. Thus medium sized farms have become the main body of American family farms. Combined with the status quo of agricultural development in China, peasant households have small land area, scattered and fragmented plots. It is suggested that on the basis of gradually

completing the rural land transfer system, farmers with management ability and production technology should be strongly encouraged to explore and rent more land in various ways, so as to realize medium scale operation.

2. It is advisable that improve the social security system and other policies, while actively cultivating subsequent forces in agriculture. The aging of family farm operators is a problem that exists in all countries all over the world. It is necessary to continue to improve land transfer policies on the basis of respecting the regular pattern of population life cycle, and promote the willingness of elderly operators to quit operation by providing effective social security system. Meanwhile, it is also advisable to further encourage young farmers below 40 years of age, returning entrepreneurs and rural elites to engage in agricultural work, actively explore the integration of agriculture and tourism and other business forms, and instruct peripheral farmers to increase their incomes.
3. It is necessary to improve the level of socialized agricultural services and facilitate the market promotion and sales system. Socialized service is the need of agricultural land agglomeration, scale operation and specialized production. Meanwhile, it is necessary to continue to improve the agricultural product marketing system. By the way of regional brand cultivation, geographical indication certification, promotion, agricultural fairs, agricultural products festival, and other ways

to further expand the distribution channels of agricultural products, so as to raise farmers' income, and promote farmer happiness.

REFERENCES

- [1] Pan W G, Xu H, & Zheng J G. (2013). Development and enlightenment of agricultural operators in the process of agricultural modernization in South Korea. *World Agriculture*, 9, 44-49.
- [2] Lu Y R, Liu B C, Pan Y, & Qiu DX. (2018). Changes in the scale and structure of american farms and their implications for China. *World Agriculture*, 05, 4-12.
- [3] Zhang S Y, Jiang Q Y, Luan Jingdong, Lan X T, & Fang D. (2014). Analysis and enlightenment on the process of large-scale agricultural operation in the United States and Japan. *Agricultural Economic Issues*, 1, 101-109.
- [4] Xu Y B. (2017). American agricultural support policy: Development process and future trend. *World Agriculture*, 08, 111-117.