

The Xinjiang Production and Construction Corps family farm land management benefit

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Abstract. The household contract responsibility system has contributed to the increase of farmers' income and the development of agricultural economy. This is a great innovation on the road of agricultural development in China. With the rapid development of China's economy. The shortcomings of the land management model are highlighted. Since the 21st century, the land management model of family farm all over the country. It has the advantages of large scale operation, high mechanized operation, high labor efficiency and good economic benefit. It is also suitable for the direction of agricultural development in China. The economic benefit of Xinjiang production and construction corps has declined in recent years, and the proportion of grain output in the country is decreasing. This has both natural and economic factors, as well as the factors of land management system. This paper takes the region of Xinjiang Production and Construction Corps as the research area. Through the statistical yearbook of the corps and the government work report, obtaining information on the economy, water conservancy facilities and agricultural mechanization of the Corps. Combined with the questionnaire survey and interview of the two groups, collected the cost and benefit of two kinds of land management model. From the economic model, agricultural mechanization, ecological agriculture, comprehensive benefit and so on, compared two kinds of land management model. The results are as follows, the family farm of the Xinjiang production and construction corps has experienced a process of rapid development, atrophy and development. This process reflects that under the market economy, the benefit of family farm operation is obviously higher than the family contract responsibility system. To realize the comprehensive benefits of unification, in order to meet the wishes of a good life in the corps, the Xinjiang Production and construction corps shall actively promote the family farm mode.

1. Introduction

Since the 1970s, the system of household contract responsibility has replaced the people's commune system. This is a collective agricultural production and management model. With the rapid development of national economy, household contract responsibility system also faces challenges, growing material and cultural needs continue to improve. Farmers' enthusiasm and land scale management are limited by this kind of management system. It affected the process of mechanization



and modernization of agriculture. Problems such as the waste of rural labor is serious, the reduction of agricultural competitiveness began to highlight.

This article selects NongSiShi in the northwest of Xinjiang uygur autonomous region, and NongQiShi in the middle of Xinjiang. The questionnaire survey conducted in NongSiShi. Analysis of economic benefits of two kinds of land management models in this area.

2. Analysis of ecological benefits under two types of land management models

2.1 Analysis of water resources utilization benefits

NongSiShi's water fee is 0.25 yuan /m³, while the NongQiShi's water fee is 0.3 yuan /m³. The same distance reflected on the dropper, NongSiShi is 9 yuan /kg, and NongQiShi is 8 yuan /kg. With different types of crops, NongSiShi's pipeline fee is 0.15 yuan /kg. And NongQiShi's pipeline is 0.13 yuan /kg, the difference between the two is due to the freight.

Different irrigation methods, water consumption and production per unit area are different, economic benefits are also different.

Table 1. Compared with leaching irrigation and drip irrigation in the planting of cotton.

Irrigation Method	Infiltration irrigation	Drip irrigation
Annual Irrigation Amount (m ³)	400	400
Annual Irrigation Times (time)	3	8~10
Per mu Yield (kg)	200~300	350~450

NongSiShi and NongQiShi have the same area of arable land. The number of family farms in NongQiShi is more than it's in NongSiShi. NongQiShi is batter than NongSiShi in the efficiency of irrigation, high and new water saving irrigation method, electromechanical drainage area and so on. It has improved the economic benefits of NongQiShi, and plays an active role in the effective use of water resources.

2.2 Potential analysis for the use of degradable film

The film is a thin layer of petrochemical products. It can maintain temperature, moisture, soil and fertilizer. The film can also effectively prevent the damage of the seedlings by the pests. Xinjiang is arid and rainy. With large temperature differences, it's very benefit to the development of crop farming. And then, the Corps gradually formed a habit and dependence on the use of mulching film. It takes a lot of manpower and material resources to clean the film, this is the reason why many farmers do not clean the film. The remaining mulch remains in the land, which is not only unfavorable for the growth of crops, but also destroys the soil.

Table 2. The crop production rate in Plastic film residue content of 58.5kg/hm².

crops	corn	wheat	soybean	Vegetables	cotton
Yield reduction rate	11~23	9~16	5.5~9	14.6~59.2	10~23

2.3 Comparison and analysis of chemical fertilizer and pesticide application

The use of chemical and pesticide of NongQiShi is lower than NongSiShi. Especially for the application of pesticides, NongQiShi is 3.54 tons less pesticide per hectare than NongSiShi, and only 57.73% of NongSiShi. The protection of the quality and quantity of cultivated land is not only for the economic benefits of today's farmers, but also for the sustainable development of the successor agriculture. Leaving more healthy land resources to future generations is the obligation and responsibility of contemporary people. Therefore, the development of family farms is also a measure to protect land resources.

3. Analysis of two kinds of land economic models' Economic benefit

For example, there is a couple of NongSiShi who has limited area of arable land, which is only one share of the land area. The year-end profit is 29960yuan, net profit is not enough to pay for their pensions. There are 50 couples participated in the questionnaire of the corps, but the annual net income exceeds 8000 yuan only 4 households. Because they leased the land of relatives in private, the planting area is more than 6 hectare. Above all, the business model is similar to the family farm.

Corps unified allocation of large-scale agricultural machinery, many families use one same machine to save money. Due to the limited amount of land contracted by the household contract responsibility system, they can only choose the same crops. But family farms have larger land, they can grow a variety of crops. Xinjiang's agriculture is constrained by climatic conditions, that is the reason why the survey only select data from 2016 to 2017 for comparison.

Table 3. Comparison of Economic Benefits of Two Land Management Models.

	Household contract responsibility system		Family Farm		
	raise crops	To make seeds	Wheat	Beet	To make seeds
Unit cost of land (yuan)		1300	1100	1200~1400	1700
Scale of operation (hectares)		1.45	6.66~8	12~13.33	13.33
Total annual cost		28340		666000~752000	
Old-age pension		3600		8000	
Crop unit price		6	2.8	0.48	6
Per mu yield		229	620	6000	600
Annual gross income (× 10 ⁴ yuan)		2.996		141.2~150.432	
Annual net income (× 10 ⁴ yuan)		-0.558		66~83.832	

Note: the price of wheat per kilogram is 2.4 yuan, the state subsidy is 0.2 yuan, the government subsidy is 0.2 yuan, so the total price is 2.8 yuan per kilogram.

As shown in table, the income gap between the two land contracting systems is very large under the same climate conditions in the same year. This fully demonstrates the theory of scale yield. The farm owners need to manage a large scale of land to further expand the scale of family farm management experience. Therefore, the family farm not only increased the income of employees, but also increased the farmers' confidence in it. The implementation of the family farm land management model will greatly increase crop yield and enrich workers' life.

4. Analysis of social benefits of two types of land economic models

College graduates who aged 20 to 30 have many difficulties in finding jobs. Apply for technical posts according to their expertise to get wages or dividends. Solve the employment problem while also helping them to accumulate capital and farm management experience. If the amount of land is small, the funds for renting their own land can also be invested in other people's family farms. This will not only increase the household income of farmers with small land area, but also narrow the wealth gap.

5. The hinder of the regiment's development of family farms

5.1 Large gap in land production conditions

Arable land with good soil conditions is very popular in the corps' family. The Corps reclaims saline-alkali soil and desertified land around each division every year, and the reclamation is very difficult. Each division will encounter many difficulties due to its different regions. Some groups are short of water and it takes many years to increase the depth of soil humus. The divisions with less arable land are in urgent need of expanding land, the task of reclamation is even more arduous. In summary,

Xinjiang is a province with a large amount of land reserves. The light, heat, and natural growth conditions here are suitable for cotton, fruits, vegetables, seed production and other crops. However, the constraints of soil quality and area have hindered and made it difficult for large-scale land management.

5.2 Constraints of economic conditions on the scale of land management

There are only few farmers can contract large areas of land in the family contract business model. Many of these are skilled and experienced in farming, through the accumulation of capital to continuously expand the scale of operation, and gradually become a large grower. Because of the cost of land outside the target area is higher than that in the indicator area, more farmers only cultivate the land within the indicator. In addition to deposits, farmers' funds are loans from the Agricultural Bank of China or rural credit cooperatives. But the amount of loans is limited, the maximum amount of loans is only 100,000 yuan. Many farmers are poor and it is difficult to borrow money from each other.

5.3 Lack of cognition on land ecological management

The educational level of farmers is generally low, and the understanding of land ecological significance is not enough. In the process of agricultural farming, farmers and Corps are most concerned about the annual net income. Non-degradable pollutants in the arable land affect the growth of crops, and decomposition is difficult. According to relevant data, the worst case scenario can reduce crop production by 23%. Workers continue to farm in contaminated fields and food security is threatened.

For example, in terms of the amount of chemical fertilizers, farmland has changed from immersed irrigation to mechanized drip irrigation. The chemical fertilizer is integrated into the drip irrigation water and enters the field accurately into the root of the seedling. The advantage is to avoid the waste of immersion and effectively control the amount of chemical fertilizers. Drip irrigation benefits soil protection and cost reduction. The amount of potassium dihydrogen phosphate used after drip irrigation is less than 0.5 tons per hectare. Technicians provide a scientific ratio in the amount of phosphate fertilizer, urea, and potassium fertilizer. The ratio of crops to drip irrigation is 74%, while traditional fertilization is 30%. Workers can not understand the basis of proportional formation, so in the actual fertilization process still use the proportion of the past immersion irrigation.

5.4 Other aspects

The imperfections and instability of policies have also greatly reduced the enthusiasm of farmers to run family farms. The Corps has implemented the household contract responsibility system for nearly 40 years. Farmers have developed a strong dependence on this land management model. Due to the small scale of the land, farmers will pay more attention to the planting process, with little or no attention to management. In addition to employing short-term workers, the rest are basically family members that do not involve economic distribution. Farmers are not good at managing the funds in family farm operations, nor are they good at managing farms with slightly more complex personnel structures.

6. Conclusion

The Xinjiang Production and Construction Corps family farm has experienced a rapid growth-atrophy-redevelopment wave-like development process since the 1980s. This development process shows that it has the foundation and potential for the development of family farms. Family farms have obvious advantages in saving water resources and reducing land pollution. Mechanized drip irrigation is used on family farms, which saves 60 square meters of water per hectare per person than manual irrigation. In Xinjiang, water is a limiting factor for crop growth, and droppers have undoubtedly improved the crop's growth environment. Family farms use biodegradable plastic film. Spraying pesticides per hectare of farmland is less than 3.54 tonnes of household contract responsibility system. Reduce the probability of land being contaminated.

Family farm has a higher proportion of scientific and technical personnel per 100 people than household contract responsibility system, and the per capita income is also high. The gap between rich and poor in urban and rural areas is small. It is conducive to national unity and the sustainable development of society. The advantages of family farms are obvious, but there are significant differences in the natural and economic conditions of the farms. Promoting the family farm business model cannot be eager to succeed. It should follow local conditions and the market to help the family farm develop well. Farmers are encouraged to voluntarily and autonomously invest in family farms. Government managers should continue to introduce preferential policies to broaden financing channels. Promote family farms in terms of management systems, capital, technology, information, and public opinion.

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