

## **Analysis of factors influencing household income in Xinli family farm in Zhalut Banner**

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### **Abstract**

As the development direction of modern agriculture, family farm has become a new driving force to further accelerate agricultural development and promote rural vitalization. Since family farms were first proposed in the No. 1 document of the Central Government in 2013, Inner Mongolia Autonomous Region has made initial achievements in exploring the construction of new agricultural business entities such as family farms. In the development of family farms, the production and life of farmers also have a certain impact. Based on the analysis of the development of Xinli family farm in Zhalut Banner, this paper explores the influencing factors of farmers' income. Put forward the countermeasures to promote the development of family farms and farmers' living standards faster and better. Through literature research, questionnaire, sample statistical analysis, empirical analysis and other methods. Combined with the research of domestic and foreign scholars, the empirical analysis of farmers' education level, planting and breeding experience, understanding of relevant policies, complete income and expenditure records, etc., is carried out to establish a regression model. The study shows that the main factors affecting the income of farmers include the age of farmers, the level of education of farmers, the number of years of farming experience, the number of household labor force and the value of agricultural machinery and tools. Finally, combined with the results of the model, it is proposed to strengthen the training of talents. Expand financing channels; Countermeasures and suggestions on promoting the combination of Internet + and modern agriculture.

### **Keywords**

Family farm; farmer's income; questionnaire survey.

### **1. Introduction**

Under the background of rural revitalization strategy, family farm, as a new type of agricultural main body, conforms to the new situation of agricultural modernization and is an important carrier connecting small farmers and large markets. Since the concept of "family farm" was first put forward in the No. 1 document of the CPC Central Committee in 2013, the role of family farm in increasing farmers' income has become a consensus in the theoretical circle. In 2020, the No. 1 document of the Party Central Committee once again emphasized that for new agricultural products, they must be combined with family farms and farmers' professional cooperatives. It can be seen that family farms will produce a huge driving force for the development of modern agriculture, and play an important role in improving the income level of farmers.

To develop family farm, we must promote the innovation and development of farm management system. It improves the organization of the whole production process, agricultural circulation and consumption, and becomes a better agricultural scale management model. It can be seen that there is a certain relationship between family farm and farmers'

income increase. Family farm lays a good foundation for farmers' agricultural production, and guides farmers to increase their income quickly. Inner Mongolia as a minority area, the overall economic level is still in a relatively backward stage, there is a certain gap in agricultural production and management more developed areas, farmers' income increase and rural development has attracted wide attention.

How to improve farmers' income is an important issue in Inner Mongolia's economic development, especially in rural agriculture and animal husbandry. Farmers' income not only directly affects the living standard of farmers, but also indirectly affects the development of rural economy. Therefore, under the background of family farm, how to increase farmers' income is of great significance to agricultural rural development, rural revitalization and reducing the gap between urban and rural areas. In this paper, Xinli family farm in Zhalut Banner is analyzed as a case, and multiple regression analysis is used to discuss the factors affecting the income of farmers in this farm, and according to the analysis results, some countermeasures and suggestions are provided for the development of this farm and the increase of farmers' income.

## **2. Analysis of the Current Situation of Xinli Family Farm and Its Farmers in Zhalute Banner**

### **2.1. The basic situation of Xinli Family Farm in Zhalute Banner**

Xinli Family Farm in Zhalute Banner, Tongliao City, Inner Mongolia is located in Manghatu Village, Gerchaoer Sumu, deep in the Horqin Grassland. It is a private enterprise that mainly engages in animal husbandry and also integrates the cultivation of crops, nursery flowers, Chinese medicinal herbs and the promotion of agricultural machinery. Currently, it has registered one trademark "Xinli Farm" and one brand of mutton products "Menghesein", and has initially formed a good situation where brand products drive the development of the enterprise.

With the goal of building a demonstration base for animal husbandry, Xinli Family Farm in Zhalute Banner has adopted the development model of "leading enterprise + base + cooperative organization + farmers and herdsmen", accelerated the process of breeding improved varieties, and successfully bred the new Menghesein sheep variety based on local advantageous breeds.

With the goal of implementing a leading strategy, Xinli Family Farm in Zhalute Banner established the Wosha Tribe Cooperative Union and successively set up five agricultural cooperative branches: Fengshi Grain Cultivation, Manghatu Meat Sheep Breeding, Senmiao Forest and Grass Cultivation, Baocaiju Medicinal Herbs Cultivation, and Fengda Agricultural Machinery Professional Cooperative. Xinli Family Farm in Zhalute Banner has adopted the "Internet +" marketing model, expanded the scale of the industrial base, and vigorously promoted the "Eight Unifications" management model. Currently, it has contracted 650 acre of farmland and 3,000 acre of forage base, attracted 136 farmers and herdsmen to join, and the number of Menghesein sheep raised has reached 8,000.

### **2.2. Income status of farmers of Xinli family farm in Zhalute Banner**

The total income of farmers is divided into four parts according to the sources of income: wage income, income from family operation, property income and transfer income. Through on-site investigation and data sorting, in Xinli Family Farm, the proportion of fixed wage income obtained by working in townships, villages and other units is 10.3%; the proportion of family operation income mainly obtained through agricultural production and operation and breeding is as high as 89.6%. Some farmers, on the basis of agricultural planting and breeding, also obtain property income from renting out farmland, grassland and other rents, as well as transfer

income from subsidies such as grassland restoration and agricultural mechanization purchase subsidies.

Table 1 Table of per capita income levels of rural households

Household income per capita(Yuan)	Frequency (household)	Percentage (%)
Under 5000	12	12.50
5000-10000	31	32.29
10000-20000	36	38.54
Subtotal	16	16.67

Data source: Questionnaire survey

The per capita income of the households in Xinli Family Farm was ranked in descending order and divided into four levels, as shown in Table 1. The data above indicates that the majority of the households in the farm have a per capita income ranging from 5,000 to 20,000 yuan. Based on the total number of family members and the number of laborers, as well as their own assessment of their income level in the village, it can be seen that the current living standards of the households in this family farm are above average. Excluding some natural factors, the income level of the households has been increasing year by year after joining Xinli Family Farm. During the on-site investigation, the agricultural operation models of the households in the farm were divided into three parts: planting type, breeding type, and integrated planting and breeding type. The breeding models of the breeding-type households include pen breeding, grazing breeding, and semi-mechanical breeding, and the breeding scales also vary.

Table 2 Table of farmers' production cost and labor cost input

Production Expenses and Labor Costs (Yuan)	Frequency (household)	Percentage (%)
Under 10,000	27	28.13
10000-20000	36	37.50
20000-50000	23	23.96
Over 50,000	10	10.42
Over 50,000	96	100

Data source: Questionnaire survey

Production expenses and labor costs are essential conditions for farmers' agricultural production and operation. The total income minus the production cost is the annual profit of the farmers. During the investigation and research, it was found that most farmers in Xinli Family Farm have little knowledge of their annual production costs. The majority of them only have a rough estimate, while a small number of farmers are not clear about their production expenses. As shown in Table 2, the largest proportion of farmers, accounting for 37.5%, have production expenses and labor costs ranging from 10,000 to 20,000 yuan. Only 10 farmers have production expenses and labor costs above 50,000 yuan, accounting for 10.42%. Due to the current popularization of mechanized agriculture, 13.7% of the farmers indicated that the proportion of labor costs is gradually decreasing, and agricultural operations are trending towards specialization and modernization.

### 3. Analysis of influencing factors of farmers' income in Xinli family farm

#### 3.1. Research Design

##### 3.1.1. Data sources and questionnaires

Based on the current development status of Xinli Family Farm and its farmers, as a minority area, the gap between urban and rural areas is relatively large. To address this issue, an online

form was used and one-on-one interviews were conducted with some farmers to investigate and comparatively analyze the production and living conditions of the farmers.

This survey questionnaire on the influencing factors of farmers' income mainly consists of two parts. The first part covers the basic information of the farmers, including questions about their gender, age, education level, and the number of family laborers. The second part focuses on the production and operation conditions of the farmers, including questions about labor costs, government subsidies, understanding of relevant policies, complete income and expenditure records, and the popularization of e-commerce. This questionnaire survey was conducted through a combination of online collection and offline filling. After removing invalid questionnaires, a total of 96 valid questionnaires were accumulated, with an effective questionnaire recovery rate of 94.23%. From the perspective of the population distribution of the survey questionnaires and their validity, the quality of the data is relatively high and can meet the needs of the survey.

**3.1.2. Model construction and variable definition**

There are many factors that affect the income of farmers in family farms, according to the results of the questionnaire and relevant research. Seven main influencing factors were selected, and EViews7.0 software was used for multiple regression analysis, and the model was established as follows:

$$y = C + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5 + a_6x_6 + a_7x_7$$

Where Y represents the total household income of the farmer as the explained variable, X1 is the age of the farmer, X2 is the educational level of the farmer, X3 is the number of family labor force of the farmer, X4 is the number of years of planting and breeding experience, X5 is whether there is a relatively complete record of income and expenditure, X6 is the value of agricultural machinery and tools, X7 agricultural insurance expenses, and C represents the constant term. a1-a7 are the coefficients of the explanatory variables. Specific variables are defined as follows:

Table 3 Model variable definitions

Variable Types	Variable name	Symbol	Variable meaning
Explained variable	Total household	Y	Income from farmers' participation in agricultural production and operation (Yuan)
	Income	X1	Actual age of farmers (years)
	Age	X2	1= primary school and below, 2= junior high school, 3= senior high school and technical secondary school, 4= bachelor's degree and junior college, 5= master's degree and above
Explanatory variables	Education level	X3	Labor force actually involved in production and operation of the family (person)
	Number of household labor force	X4	Actual number of years of farming households (years)
	Years of experience in farming	X5	1= yes; 2= No
	Whether there is a more complete record of income	X5	1= yes; 2= No

and expenditure		
Value of agricultural machinery and tools	X6	Actual value of agricultural mechanization owned by farmers (Yuan)
Agricultural insurance expenses	X7	Actual agricultural insurance expenses for production and operation of farmers (Yuan)

Data source: Questionnaire survey

### 3.2. Statistical analysis of samples

#### 3.2.1. Sample statistical analysis of basic information of farmers

During the research and in the questionnaires, it was found that the number of male farmers was relatively large, accounting for 69%, while the proportion of female farmers was 31%. The average age of farmers was 47.65 years old. Among them, the average age of planting farmers was 47.87 years old, that of breeding farmers was 46.58 years old, and that of farmers combining planting and breeding was 47.32 years old.

As agricultural production and operation have relatively high requirements for the physical condition of farmers, with the increase of age, it may lead to a decline in their physical condition, affecting their production and operation as well as total income. Table 4 summarizes the average income of farmers in different age groups. From the overall trend, it can be seen that as age increases, the income of farmers gradually decreases.

Table 4 Table of age and income levels of rural households

Rural Household Age	Frequency (household)	Percentage (%)	Per capita income (Yuan)
20 to 30 years old	11	11.46	41298.3
30-40 years old	26	27.08	52719.2
40-50 years old	34	35.42	42819.2
Over 50 years old	25	26.04	36271.8
Subtotal	96	100	-

Data source: Questionnaire survey

The improvement of farmers' comprehensive quality is one of the key indicators of farmers' income. Therefore, as shown in the following Figure 1 from the survey questionnaire, the overall educational level of farmers is not high. The highest proportion is those with primary school education or below, accounting for as high as 43.6%; followed by junior high school education, accounting for 34.2%; senior high school and secondary vocational school education, accounting for 13.7%; and college and bachelor's degree, accounting for 8.5%. In addition, farmers' working experiences also vary. The research data shows that the identities of farmers in this farm consist of individual business owners, main responsible persons of cooperatives, ordinary farmers and village cadres, among which ordinary farmers account for the vast majority.

In the operation and management of family farms, due to the generally low level of mechanization, there is a heavy reliance on labor. The number of family laborers will directly affect labor efficiency and, consequently, the income of farmers. As shown in Table 5, the per capita income of households with 1-3 family laborers is 38,371 yuan, which is far lower than that of households with 4-6 family laborers at 43,291.7 yuan. This indicates that as the number of family laborers increases, income also gradually increases. As can be seen from Table 4, the number of family laborers in the surveyed farm households is mainly concentrated in the 1-3 person range. Among the 96 surveyed households, 87 have 1-3 family laborers, accounting for 90.63% of all households participating in the questionnaire survey. Only 9 households have 4-

6 family laborers, accounting for 9.37% of the total sample. There are no households with more than 6 family laborers.

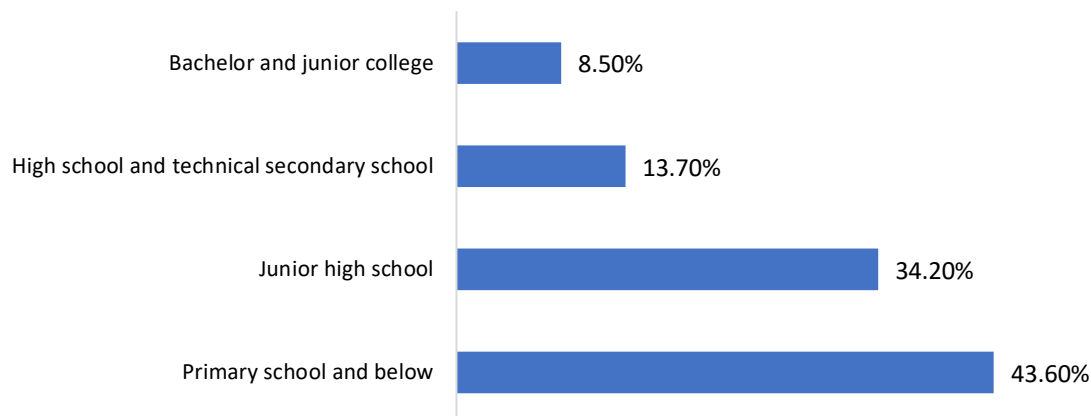


Figure 1 Distribution of farmers' education level

Table 5 Table of income levels of the number of laborers in rural households

Number of laborers (persons)	Frequency (households)	Percentage (%)	Per capita income (Yuan)
1 - 3	87	90.63	38371
4 - 6	9	9.37	43291.7
More than 6	0	0	-
Subtotal	96	100	-

Data source: Questionnaire survey

**3.2.2. Sample statistical analysis of farmers' production and management**

The research data on the production and operation of farmers mainly include the number of years of farming and breeding experience of farmers, their understanding of the policies issued by the government to support farmers, credit characteristics, the way of choosing financial support, the main reasons affecting the expansion of agricultural operations, whether they have complete income and expenditure records for agricultural operations, whether there is a shortage of professional technical talents in agricultural operations, and whether they are willing to combine their agricultural operations with rural e-commerce, etc.

As the number of years of farming and breeding increases, farmers have more abundant experience in agricultural and livestock production and operation, and the agricultural production laws they master have a certain positive effect on their operating income. As can be seen from Table 6, the per capita income of households with less than 10 years of farming and breeding experience is 37,281.5 yuan; the per capita income of households with 10 to 20 years of farming and breeding experience is 42,827.1 yuan; and the per capita income of households with more than 20 years of farming and breeding experience is 47,621.8 yuan. It can be seen that the income of farmers' households generally increases with the increase in the number of years of farming and breeding experience.

Table 6 Income level table of farmer's planting and breeding experience years

Years of planting and breeding experience (years)	Frequency (households)	Percentage (%)	Per capita income (Yuan)
Less than 10	26	27.08	37281.5
10 to 20	31	32.29	42827.1
More than 20	39	40.63	47621.8
Subtotal	96	100	-



Data source: Questionnaire survey

In the field research, it is found that the characteristics of farmers' loans are generally a one-year repayment period, so they have to repay the loans at the end of the year, and the borrowing behavior is likely to lead to the decrease of farmers' income this year. As shown in Table 7, among the surveyed farmers in Xinli family farm, 61 have borrowing behaviors, accounting for 63.54% of the total sample. There are 35 farmers without borrowing, accounting for 36.46% of the total sample. In terms of the per capita annual income of rural households, the per capita annual income with loans is lower than that without loans.

Table 7 Table of peasant household borrowing characteristics income hierarchy

Whether there are loans	Frequency (households)	Percentage (%)	Per capita income (Yuan)
Yes	61	63.54	37281.5
No	35	36.46	42827.1
Subtotal	96	100	-

In the borrowing behavior of farmers, financing channels are particularly important. As shown in Figure 2, at present, about 46 households in Xinli family farm obtain financing through private lending, accounting for 47.92%. Bank loans to 31 households, accounting for 32.29%; 16 households were supported by government funds, accounting for 16.67%; The others are 3 households, accounting for 3.13%. In addition to the government support, the other two financing channels have some shortcomings, which have a certain reverse effect on the development of rural household income. For example, bank loans have cumbersome procedures, small amount, short term and other factors; However, the interest of private lending is relatively high, which increases the cost of loans and leads to the reduction of the income of farmers with loans. At present, the education level of farmers is generally low, especially the older generation of farmers, who are not well educated and have a poor ability to accept new things.

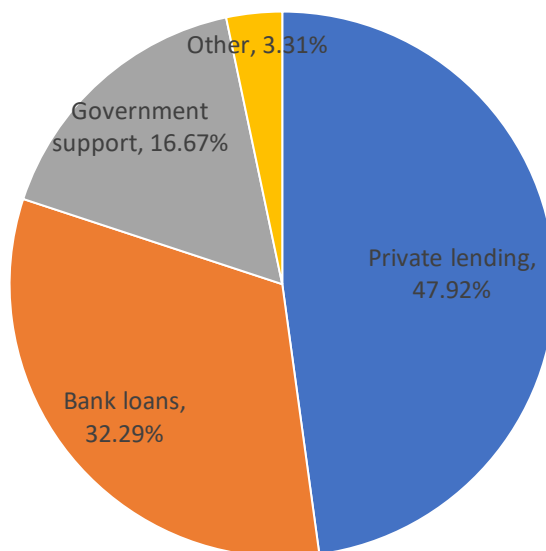


Figure 2 The proportion of farmers' financing channels

### 3.3. Empirical analysis of influencing factors of rural household income

Table 8 Regression results of influencing factors of peasant household income

Constants and explanatory variables	Estimated coefficients	Standard error	Two-sided probability
C	828253.1	182739.2	0.0017
X1	-35.53176	143.9213	0.0023

X2	561.8624	214.3928	0.0043
X3	1821.234	534.2456	0.0000
X4	4.910833	3.483702	0.0025
X5	145.2839	87.37212	0.7425
X6	621.2834	372.2937	0.0081
X7	48.28124	13.28374	0.0492
$R^2$	0.760169	$\bar{R}^2$	0.73161

It can be seen from Table 8 that the correlation coefficient of the model  $R^2$  is 0.760169; The modified coefficient of determination  $\bar{R}^2 = 0.731613$ , indicating that the model has a good degree of fit to the data, so it passes the goodness-of-fit test. In the linear regression results, according to the F-test, it can be concluded that the overall linear relationship of the equation is significantly established at the confidence level of 95%, that is, the linear relationship between the explained variable and the explanatory variable is significantly established in the whole, which passes the significance test of the equation. The variables of the farmer's age, the farmer's educational level, the farmer's years of planting and breeding experience, and the number of family labor force passed the significance test, which is significant at the level of 1%. The variable value of farm machinery and tools of the farmers passed the significance test at the 5% level.

In addition, whether there is a relatively complete record of income and expenditure has a positive effect on farmers' income, but it fails to pass the P test and is not significant at the level of 5%, rejecting the null hypothesis. It can be seen that the proportion of income and expenditure records does not have a significant impact on the income of farmers. In the questionnaire survey data, most farmers generally estimate their agricultural production and operation income, and only a small part of farmers have the habit of manually recording their agricultural operation income and expenditure. For farmers, their financial knowledge reserve is limited and their business scope is relatively single, although there is no habit of recording their financial operation, it will not have a significant impact on their income.

To sum up, six explanatory variables of the seven variables analyzed in the model have a significant effect on the income of farmers in the family farm.

(1) The age of farmers. The age of the farm household has a negative but small effect on the income of the farm household. This result is also consistent with the actual situation that the older the person is, the fewer the agricultural production and business activities he or she can choose to engage in.

(2) Education level of farmers. With the development of modern agriculture, the acceptance of many breeding information and the use of advanced tools require farmers to have a higher cultural level. Therefore, in the future, farmers must strengthen training and education, and constantly improve their own cultural quality, so as to lay a good quality foundation for increasing production and income.

(3) Years of planting and breeding experience of farmers. The number of years of planting and breeding experience of farmers has a significantly positive impact on their production and management. A higher number of years of experience in farming and raising livestock will greatly reduce some unpredictable natural risks and maintain the stability of development. At present, the degree of mechanization of agriculture and animal husbandry in Inner Mongolia is low, and the traditional agricultural development still occupies a large proportion. Therefore, rich experience is a valuable resource to promote the development of family farms and the income of farmers.

(4) The number of family laborers in rural households. The correlation coefficient of the number of laborers in the rural household is the maximum value of all explanatory variables,



and its effect is the most significant. At present, the production and operation of agricultural and animal husbandry in Inner Mongolia family farms still needs to rely on a large number of manpower, and the level of mechanization is low, so the production and operation still has a great dependence on labor force. Therefore, the increase of labor force will lead to the improvement of production efficiency, and then increase the income of farmers. Therefore, it is an inevitable trend for family farms to promote the development of agricultural mechanization, improve agricultural production efficiency and reduce labor dependence.

(5) The value of agricultural machinery and tools of farmers. The value of owning agricultural machinery and tools has a significant positive impact on the increase of household income. The higher the value of agricultural machinery and tools is, the higher the degree of agricultural mechanization is and the higher the operation efficiency is, thus increasing agricultural output and raising the income of farmers. Scale operation is one of the characteristics of family farms, and the value of agricultural machinery and tools can reflect the mechanization degree of family farms to a certain extent. However, at present, the popularity of agricultural mechanization in Xinli family farms is at a medium level; therefore, the premise of realizing agricultural modernization is to realize agricultural mechanization.

(6) Agricultural insurance expenditure of farmers. Agricultural insurance is an important means to ensure the sustainable development of agriculture and stabilize the market price of agricultural products. The great advantage of insurance policy instruments is that they can work in concert with other policy instruments. Agricultural insurance plays an important role in ensuring farmers' income and dispersing agricultural risks, which can improve farmers' income to a certain extent.

## **4. Results and analysis**

### **4.1. Research conclusion of Xinli family farm development and farmers' income increase**

In this paper, by means of field research, the development status of Xinli family farm in Zhalut Banner and the basic situation and income status of the farmers were statistically sorted out and analyzed. The results show that age has a negative correlation with the total household income. The years of planting and breeding experience, the number of family labor force, the value of agricultural machinery and tools owned by farmers and the expenditure of agricultural insurance all have a positive correlation with the household income. However, whether there is a complete record of income and expenditure has no significant impact on the household income of farmers. In addition, the financing channels of farmers in this family farm are generally narrow, and most farmers reflect the lack of professional and technical personnel in production and operation. With the rapid development of science and technology in China, more and more farmers keep up with the pace of The Times and are willing to combine with the Internet to develop e-commerce agriculture.

### **4.2. Countermeasures and suggestions for the development of Xinli family farm and the increase of farmers' income**

#### **4.2.1. Strengthen farmers' education and training to improve their own quality**

As a minority region, Inner Mongolia mainly develops animal husbandry, and there is a certain gap in education level compared with other developed regions. In the process of promoting the increase of farmers' income, we should not only pay attention to the objective factors, but also ignore the subjective factors, and put them in the same position. Therefore, with the strong support of the government, efforts should be made to improve the quality of farmers, increase investment in education, strengthen technical training, and promote the development of family farms and farmers' income.

#### (1) Improving the ideological and moral quality of farmers

Family farms should carry out publicity and education for their farmers, and timely issue government documents, policies and relevant thoughts to ensure the timeliness of information. Through a variety of ways to carry out knowledge and skills training for farmers, from traditional farmers to new professional farmers. Combined with the production process involved in the family farm, targeted production skills training is carried out to adapt to the requirements of modern agricultural production.

#### (2) Actively carry out relevant technical training

In the questionnaire, 87.5% of the farmers said that they lacked professional and technical personnel in agricultural production, and some farmers were still engaged in the production and operation of manual agriculture. As a relatively remote minority region, the spread of modern technology is slow. Family farms should give full play to the guiding role of government departments and units at all levels. Combined with their own production and operation conditions, we will take various forms to train farmers to improve their production efficiency and increase their income. At the same time, we should actively cultivate and introduce high-quality personnel, encourage and support college graduates and agricultural technicians to return to their hometown to start their own businesses. The government should provide relevant policy subsidies, project support and necessary social security to make them become a new generation of knowledge-based and technology-based agricultural leaders.

### **4.2.2. Improve the fund supply system and increase policies to support agriculture and benefit agricultur**

#### (1) Expand financing channels and strengthen credit services

The results of the questionnaire show that 57.14% of farmers have insufficient funds in the process of agricultural production, more than half of farmers have credit demand, and the interest of private lending is generally relatively high, which virtually increases the pressure of farmers. Therefore, to solve the financial needs of farmers, we need to be paid attention to from all aspects.

First of all, financial institutions can reduce the interest on the basis of appropriately increasing the credit limit of farmers. At the same time, the government's policy support is also very important. In order to promote commercial banks to favor loans to rural households, measures such as discount interest and tax reduction were taken. Secondly, family farms can vigorously organize and carry out financial services, increase the variety of financial products, strengthen financial innovation, and provide financial support for farmers, so that farm funds can be used on the farm and prevent capital outflow. Secondly, it is necessary to strengthen the popularization of financial knowledge and improve farmers' financial awareness. During the field visits, we found that most of the farmers only received a small amount of interest from their idle funds and did not know much about other financial products. Family farms can strengthen publicity and education in this regard, improve farmers' financial awareness, and broaden their income channels.

#### (2) Increase government support and improve the effectiveness of subsidies

On the one hand, we should strengthen and improve the rural social security system, increase the supply of agricultural production, and promote the leading role of scientific and technological achievements. While ensuring agricultural scientific research, more professional and technical personnel should be attracted to participate in the promotion of agricultural science and technology. On the other hand, we should improve the rural market system, realize the effective transfer of rural surplus labor force, and promote the rational transformation of rural household income system. We will establish a diversified input system, fully support agricultural projects, and explore a new situation in resource development. We will establish a variety subsidy system to encourage farmers to use good varieties and explore new varieties to

increase output. The use of government subsidies, including procurement of agricultural machinery and tools, agricultural technical training, and agricultural financing channels, should be monitored to improve the operating efficiency of family farms and the growth rate of farmers' income.

(3) Strengthen the insurance system and enhance the awareness of insurance participation

The government should strengthen the construction of agricultural insurance system, standardize the existing agricultural insurance services, reasonably determine the cost-benefit relationship of agricultural products, strengthen the identity of insurance companies in the hearts of farmers, guarantee the enthusiasm of farmers to buy agricultural insurance, and improve the insurance participation rate. At the same time, insurance companies can set up special insurance personnel, timely intervention in local agricultural production, real-time understanding of farmers production and management status quo. In the field research, it is found that most farmers in family farms do not trust agricultural insurance and are unwilling to participate in insurance, which is largely due to the lack of awareness of agricultural insurance. At the same time, publicity should be based on the actual characteristics of the local, innovative publicity methods. The ideology of farmers is relatively backward and the level of education is generally low.

#### **4.2.3. Improve the level of mechanization and develop modern agriculture**

(1) Promote the intelligent construction of agriculture and animal husbandry

The above regression analysis shows that the value of agricultural machinery and tools in agricultural production and operation is positively correlated with the income of farmers. Family farms should implement the agricultural mechanization promotion system, promote the combination of theory and practice, promote the close integration of agricultural research and farmers' production and operation, and promote the development of agricultural science and technology. At the same time, we will accelerate the establishment of a new agricultural scientific and technological innovation system. Traditional agricultural technology has been unable to meet the development requirements of modern agriculture, and the increase in the utilization rate of agricultural machinery can accelerate labor productivity and improve output. Intelligent mechanized agriculture can improve the quality of planting and breeding products, and increase the price of agricultural products to a certain extent, which has a positive role in promoting the income of farmers, and brings bright prospects for the development of family farms.

(2) Accelerating the construction of the agricultural and animal husbandry industry chain

Industrial structure and economic and social development complement each other and influence each other, industrial structure can drive the change of economic structure, and then improve the diversification and rationalization of farmers' income. On the basis of the cooperative economy of family farms, we will constantly use other social forces to improve supporting services and establish efficient agriculture. Guided by market demand, the internal structure of agriculture should be rationalized to improve the income of rural households.

According to its own resource advantages and market demand, the Internet + platform should be established to vigorously promote the diversified development of rural e-commerce. We will promote industrial transformation and upgrading, actively promote the famous brand strategy, step up brand cultivation, guide farmers to develop in a personalized and diversified manner, adapt to the Internet economic market, and promote innovation in individual economic forms. Planting farmers will be encouraged to use new green prevention and control technologies, breeding farmers will be encouraged to use family breeding technologies, and various models combining planting and breeding will be carried out to promote the development of circular economy. We should accelerate the progress of agricultural technology, adjust the rural industrial structure, change the mode of agricultural growth, extend the industrial chain of

agriculture and animal husbandry, expand the industrial scale of family farms, promote the diversified development of agricultural households, and increase their incomes.

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