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DISSERTATION

**MANAGEMENT OF THE DEVELOPMENT OF FAMILY FARMS IN
THE CONTEXT OF ECONOMIC TRANSFORMATION**

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ABSTRACT

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In the dissertation work, the theoretical and methodological foundations are confirmed, and practical suggestions for managing the development of family farms under conditions of economic transition are formed.

China is a country with a large population. Food security has always been a significant concern of the government, and the government must provide enough food. If more than 1.4 billion people cannot achieve the necessary self-sufficiency in food, The consequences are very serious. To ensure that food was plentiful, the country urgently needs to improve its agricultural production management system. The government is unable to effectively coordinate the activities of a large number of small-scale producers. The emergence of family farms led to the gradual concentration of land in the hands of qualified farmers. On the one hand, this reduces the number of small-scale agricultural operators and, on the other hand, increases the control of government agencies over this sector of the economy.

An important factor in the formation of family farms is economic factors, which are essential among all drivers. According to official statistics, the average farmer occupies 0.09 hectares of agricultural land in China, and the land use size of the middle peasant family ranges from 0.27 hectares (for a three-member family) to 0.47 hectares (for a five-member family). Assuming ten people work on the family farm, the family has at most 0.87 hectares of land based on the principle of equal distribution. If the average annual net income per hectare is 10,500 yuan, then the yearly agricultural income of a family of 10 is 9,135 yuan, and the per capita income is 914 yuan. Therefore, the scale of agricultural production is too small, inevitably leading to agricultural production workers can not be fully employed.

By concentrating agricultural land on farmers and families through land transfer, it can produce products with more excellent added value, grow elite crops (animal varieties), and accelerate the modernization of production processes by using modern agricultural techniques on a larger scale.

According to the present situation, the family farm has become an essential part of the agricultural component in the economic development of modern countries. Family farms are playing an increasingly important role in China's agrarian modernization process, contributing to the formation and development of farm production and the increase of farmers' income. The conducted research focuses on the fact that given the unique nature of the production process, there is fierce market competition and certain defects in the operation process of Chinese family farms. Therefore, it is of practical significance to study this subject, namely to formulate and implement the strategy of managing future development under the condition of economic transformation.

Based on the developed literature at home and abroad, as the current legislative and regulatory framework, the author expounds on the essence of the concept of a "family farm." Unlike the existing interpretation, it refers to the family as the primary production unit, family members as the primary labor force, and agricultural income as the primary source. Use oneself or transfer land to carry on appropriate scale specialization, commercialization, socialization agriculture production.

China's family farm is a new type of agricultural management. The well-developed literature notes that the scientific foundations of management theory began to take shape about 100 years ago and that management did not emerge independently. Typically, control is directed to objects or procedures. Its task is to manage the entire engineering complex, aiming to form and implement management actions, provide the necessary conditions for development, use resources efficiently and optimize the financial results of activities.

During the study, we perfect the multi-level management system of the development of a Chinese family farm, considering the world experience and information technology as an important part of the future agricultural production essential features.

At the same time, they also need state supervision, social services, rural land transfer, farmer education, to find sources of funds and establish their own brand.

As the world experience of managing the development of family farms shows, they are the subject of agricultural activity in many countries. The current legislation stipulates are land ownership parcel circulation procedures (buying, selling, leasing, mortgaging, etc.), and a reliable basis for large-scale work on family farms using modern agricultural production methods. The high level of agricultural technology, the mechanization of the process, the creation of private brands as the orientation, the stable financial environment, and the social service system of the family farm all confirm this. In some areas of China, the development of family farms has functional characteristics and advantages respectively. An example is the government-led family farm model in Songjiang, Shanghai, the family farm market model in Ningbo, Zhejiang, and the government-supported family farm model in Langxi, Anhui.

The study results show that the advantages of the development of managed family farms in these leading regions are: high comprehensive quality of farmers, leading management or market, ideal social services, well-regulated land transfer, and focus on finished product market operation and establishment of their brands. With the help of the Family Farm Association, quality management and comprehensive assistance were provided at the " Before production," " In the production process," and " After production" stages. After thinking and analyzing the operation characteristics of domestic and foreign family farms under current market conditions, the platform and guidelines for developing Chinese family farms are formed.

To form an information base, the author conducted a field survey on family farms and farmers, obtained data from related family farms, and used logistic regression to analyze the factors affecting family farms development and management empirically.

This dissertation analyzes the implementation problems of agricultural informatization in family farm management activities. Need to support the informationization of family farms. The leading role of state agencies is not vital, and the current legislative and regulatory framework needs to be adapted to existing business conditions. The slow construction of information systems and the lack of motivation of

information service providers are the factors leading to the lack of management information part of family farm development in the context of economic transformation.

Based on foreign experience, the survey results were summarized and analyzed. Processing official statistics and a list of family farm informatization measures was determined: With the participation of the national and local governments, Establish a unified information standard system to create a mature information support system for each family farm, accelerate the application of information technology in financial and economic activities, and accelerate the formation of a professional team of experts to introduce modern management information systems.

The land is essential for family development in rural areas. China has a large population and a small per capita area of arable land, so fair, effective, transparent, and lawful distribution is of undeniable significance. This is also a prerequisite for family farms to achieve a reasonable scale of agricultural production. Transferring agrarian land to farmers is considered, and current shortcomings are identified.

We determined the form of farmland use strategy. Its implementation will help: according to the land transfer procedures, the current laws and regulations to strengthen the rural land circulation policy and rules of propaganda, establishing and perfecting agricultural land financial service system, strengthen the information service of intermediary organizations, increase the introduction of land circulation market mechanism of competition.

According to the survey, the professionalism of farmers plays a significant role in managing the development of family farms. As a typical representative of modern professional farmers, family farmers are an essential part of human resource management.

Procedures for advanced training for family farmers are considered. It is found that their knowledge level is not high enough. More than 50 percent of China's working farmers are over 50. This age group is less aware of the importance of active participation in training using modern communication systems.

The author believes that the most common reasons for the lack of training effect are the single training form, the training content is not always relevant and targeted, the

information flow efficiency of learning objects is low, and the lack of monitoring and evaluation system.

Introducing the "double teacher" training system, combining online learning with offline consultation, and implementing the family farmer training system, will help to optimize feedback and improve the educational effect and professional ability of farmers and teaching staff by combining theory with practice in the educational process and production.

Marketing is an essential means of increasing the income of any agricultural producer, and the quality of the marketing process is reflected in the management of the entire family farm.

Based on the actual data obtained, a regression model is formed to improve the methodological method for the analysis of factors affecting the selection of agricultural product distribution channels in the "Internet +" environment.

Based on "Internet+," producers have many choices for the distribution channels of their agricultural products. The author evaluated the current situation of agrarian product sales channels of family farms in Henan Province, collected and analyzed the data using SPSS 22.0 measurement software, and tested the hypothesis. It is concluded that the brand and certification of family farm produce and the commercial form have a significant impact on its distribution channel. According to statistics, in the distribution channels of family farm agricultural products, the traditional spot trade channels are still dominant. Of all eight implementation areas, Internet channels ranked seventh at 9.40 percent.

According to the results, it is determined that based on the "Internet +" environment, the selection and innovation of distribution channels for family farms in Henan Province need to be further improvement. Due to awareness factors, poor equipment quality, and the attitudes of the society around them. As a result, the Internet's potential for use has not been sufficiently developed. At the same time, with the emergence of a large number of high-quality products, people gradually turn "full food" into "good nutrition" and a "healthy diet." Agricultural brands have become trendy, establishing their brands and

obtaining certificates to take priority in sales. Family farms still need to strengthen their branding and certify their products.

In the past two decades, the rapid development of family farms has led to improved agricultural standards. However, family farms are becoming more demanding and dependent on capital due to high risks, low yields, long cycles, and the need to scale up agricultural production. Because of the nature of farming, it is difficult for family farms to qualify for bank loans, and financing problems limit their development.

With the development of society, the Internet plays an essential role in all fields. Internet finance has changed the traditional financial model, broadened the financing channels, and better met the needs of social and economic development. As a new type of agricultural entity, family farm financing is limited by the complexity of access, high financing cost, and lack of adequate collateral. With the development of economy and science and technology, Internet crowdfunding has become popular due to its convenient use, low cost and relatively transparent information content, providing a guarantee for the development of family farms.

With the help of the platform, it is suggested that the introduction of the family farm on the Internet and the raise mechanism, this mechanism is composed of different stages: create a professional platform, start-up and demonstration projects, investors interested in the project choice, development investment, financial results, at the same time, and will help to expand the sales channels, to solve agricultural producers financing difficulties.

Compared with traditional financing, online crowdfunding is more suitable for providing financial resources for family farms. The implementation of the proposed approach allows the regulation of external funds to be consolidated to ensure the security of investors' resources and to guide family farms to conduct production activities in a standardized manner upon receipt of funds.

Combining theory with practice, the strategy of this scientific work was applied to the method of agricultural product distribution channels, and the organizational and practical components of family farm sales of agricultural products were created based on the operation of "WeChat groups" under the conditions of online sales.

Keywords: agricultural management, differentiation of farmers, production efficiency, land policy, institutional change, information component of management, competitive mechanism, crowdfunding, management, land transfer, market mechanism, development, agricultural products, agriculture, family farms, farmer's farming, social structure, rural governance capacity, brand building, development management.

АНОТАЦІЯ

Ню Лічен. Управління розвитком сімейних фермерських господарств в умовах трансформації економіки - Рукопис.

Дисертація на здобуття наукового ступеня доктора філософії за спеціальністю 073 - Менеджмент. – Сумський національний аграрний університет, Суми, 2022.

У дисертаційній роботі обґрунтовано теоретико-методологічні основи та сформовано практичні рекомендації щодо управління розвитком сімейних фермерських господарств в умовах трансформації економіки.

Китай – країна з великим населенням. Продовольча безпека завжди була основною турботою уряду, який повинен забезпечувати достатню кількість харчових продуктів. Якщо понад 1,4 мільярда людей не можуть досягти необхідної самодостатності в їжі, наслідки можуть бути дуже серйозними. Для формування безпеки щодо харчових продуктів, країна нагально потребує вдосконалення системи управління сільськогосподарським виробництвом. Уряд не в змозі ефективно координувати діяльність великої кількості дрібних товаровиробників. Поява сімейних господарств сприяє поступовій концентрації земель у кваліфікованих фермерів. З одного боку, це зменшує кількість сільськогосподарських операторів, з іншого, підвищує контрольованість даного сектору економіки з боку державних органів.

Важливим фактором формування сімейних фермерських господарств виступають економічні чинники, що мають істотне значення серед інших рушійних складових. За офіційними статистичними даними, на одного фермера припадає

0,09 га сільськогосподарських угідь, а на середньостатистичне домогосподарство в цілому менше ніж 0,67 га, що географічно розміщені на різних ділянках. Тому масштаб землекористування звичайного фермера становить близько 0,27 га (сім'я з 3 осіб) до 0,47 га (сім'я з 5 осіб). Припустити, що в роботі сімейної ферми залучено 10 осіб, то за принципом середнього розподілу сім'я має щонайбільше 0,87 га землі. Якщо середньорічний чистий дохід на гектар становить 10500 юанів, то річний сільськогосподарський дохід сім'ї з 10 осіб становить 9135 юанів, а дохід на душу населення – 914 юанів. Відповідно, занадто малі масштаби сільськогосподарського виробництва неминуче призведуть до втрати повної зайнятості працівників у сільськогосподарському виробництві.

Через інструменти обігу земельних ділянок, сільськогосподарські угіддя будуть сконцентровані для фермерів та сімей, які готові виробляти продукцію, що має більшу додану вартість, вирощувати елітні сорти культур (породи тварин), масштабніше застосовувати сучасну агротехніку для прискорення модернізації виробничого процесу.

Відповідно до реалій сьогодення, сімейні ферми стали важливою складовою розвитку сільськогосподарської компоненти економіки сучасної країни. Сімейні ферми відіграють все більш важливу роль у модернізації аграрної сфери Китаю, сприяючи становленню, розвитку виробництва сільськогосподарської продукції та збільшенню доходів фермерів. Проведені дослідження акцентують увагу на тому факті, що, враховуючи особливості виробничого процесу, наявну жорстку ринкову конкуренцію, мають місце певні недоліки в процесі функціонування сімейних фермерських господарств у Китаї. Відповідно, дослідження даної тематики, формування та реалізація стратегії управління їхнім розвитком, на перспективу, в умовах трансформації економіки вирізняється безперечною актуальністю.

На підставі опрацьованих вітчизняних та закордонних літературних джерел, чинної законодавчо-нормативної бази автором сформульовано сутність визначення поняття «сімейне фермерське господарство», яке, на відміну від існуючих трактувань, означає основну виробничу одиницю, тобто членів сім'ї – як основну робочу силу, сільськогосподарський дохід – як основне джерело, використовує

власні або залучені землі для відповідних масштабів спеціалізованого, товарного, соціально спрямованого сільськогосподарського виробництва.

Сімейне фермерське господарство в Китаї представляє собою новий тип суб'єкта аграрного бізнесу. Опрацьовані літературні джерела дають підстави зазначити, що наукова основа теорії управління почала формуватися близько 100 років тому, і тому менеджмент не виник самостійно. Управління, як правило, спрямовується на об'єкт або процес. Його завданням є адміністрування всього комплексу робіт, який спрямований на формування і здійснення управлінської дії, що забезпечує необхідний рівень розвитку, ефективного використання ресурсів, оптимізації фінансових результатів діяльності.

У ході дослідження, нами вдосконалено багаторівневу систему управління розвитком сімейних ферм в Китаї, що дозволило, з врахуванням світового досвіду, імплементавши інформатизацію в якості вагової її компоненти, визначити особливості функціонування даної складової сільськогосподарського виробництва на перспективу: державне регулювання, отримання соціальних послуг, обіг сільськогосподарських угідь, освіта фермерів, пошук джерел фінансування, побудова власного бренду.

Як свідчить досвід управління розвитком сімейних фермерських господарств у світі, то вони представляють собою основні суб'єкти сільськогосподарської діяльності в багатьох країнах. Чинним законодавством чітко визначено: право власності на землю, порядок обігу земельних ділянок (купівля-продаж, оренда, суперфіцій, емфітевзис та ін.), що формує надійну основу для масштабної роботи сімейних ферм з використанням сучасних методів сільськогосподарського виробництва. Підтвердженням цьому виступає високий рівень агротехніки, механізації технологічного процесу, орієнтація на побудову власного бренду, стійке фінансове середовище, соціалізована система обслуговування сімейних фермерських господарств. Визначено окремі характеристики, переваги розвитку та функціонування сімейних фермерських господарств в окремих районах Китаю. Як приклад можна виокремити очолювану урядом модель сімейної ферми Шанхай

Сонгцзян, ринкової моделі сімейної ферми Чжецзян Нінбо та моделі сімейної ферми Аньхой Лангсі, яка підтримується урядом.

Результати дослідження показують, що перевагами управління розвитком провідних сімейних ферм у даних регіонах є: висока комплексна якість фермерів, лідерство в управлінні або на ринку, ідеальні соціальні послуги, якісно врегульована передача землі та сімейні фермери, які зосереджуються на функціонуванні ринку готової продукції та побудові власного бренду. За допомогою Асоціації сімейних ферм здійснюється якісне керування та надання всебічної допомоги на «довиробничій», «виробничій» та «після виробничій» стадіях. Розглянувши та проаналізувавши особливості функціонування вітчизняних та зарубіжних сімейних фермерських господарств в сучасних ринкових умовах, сформовано платформу та орієнтири для розвитку сімейних фермерських господарств Китаю.

З метою формування інформаційної бази, автором було проведено польове опитування фермерів, отримано дані відповідних сімейних ферм, а також проведено емпіричний аналіз факторів, що впливають на управління їхнім розвитком, за допомогою логістичного регресійного аналізу.

У дисертації проаналізовано наявні проблеми імплементації в діяльність сільськогосподарських товаровиробників інформаційних технологій. Визначено, що поточне інформаційне супроводження діяльності сімейних ферм потребує вдосконалення. Роль державних органів не є визначальною, чинна законодавчо-нормативна база вимагає адаптації до діючих бізнес умов.

Повільна побудова інформаційної системи та відсутність мотивації в основних надавачів інформаційних послуг є факторами, які призводять до відсутності розвитку інформаційної компоненти управління в сімейних фермерських господарств в умовах трансформації економіки.

На основі закордонного досвіду, узагальнення та аналізу результатів опитування, опрацювання офіційних статистичних даних, визначено перелік заходів щодо інформатизації сімейних фермерських господарств: із залученням державних та органів місцевого самоврядування налагодити єдину систему

інформаційних стандартів, створити повноцінну систему інформаційного супроводження кожної сімейної ферми, прискорити застосування інформаційних технологій у фінансово-господарській діяльності, пришвидшити формування фахових команд спеціалістів щодо запровадження сучасних управлінських інформаційних систем.

Земля є необхідним фактором для розвитку сім'ї у сільській місцевості. Китай має велику кількість мешканців і малу площу орних земель на душу населення, тому справедливий, ефективний, прозорий, врегульований законодавчо їх розподіл носить беззаперечну актуальність. Це виступає, також, передумовою досягнення обґрунтованих масштабів виробництва сільськогосподарської продукції сімейними фермами. Розглянуто процес передачі земель сільськогосподарського призначення фермерам, визначено недоліки.

Нами ідентифіковано стратегію формування землекористування фермерських господарств, реалізація якої сприятиме стандартизації процедури передачі землі відповідно до чинного законодавства, посиленню публічності політики та правил передачі земель у сільській місцевості, створенню та вдосконаленню системи фінансового обслуговування сільськогосподарських земель, посиленню інформаційної служби посередницьких організацій, підвищенню конкуренції при запровадженні ринкового механізму обігу земель.

Визначено, що професіоналізм фермерів відіграє дуже важливу роль в управлінні розвитком сімейного фермерського господарства. Як типовий представник сучасних професійних фермерів, сімейні фермери становлять собою важливу складову управління людськими ресурсами.

Розглянуто процедури підвищення кваліфікації фермерами. З'ясовано, що сучасний рівень їх знань не достатньо високий, а підготовка не ідеальна. Кількість працюючих фермерів у Китаї віком старше 50 років складає понад 50 %. Дана вікова категорія мало обізнана з можливістю активної участі у навчанні із застосуванням сучасних комунікаційних систем.

На думку автора, основною причиною недостатнього тренувального ефекту виступає найбільш поширена єдина форма навчання, зміст якої не завжди

актуальний і цільовий, інформаційний потік об'єктів навчання неефективний, бракує систем моніторингу та оцінки.

Імплементація системи підготовки сімейних фермерів через запровадження режиму навчання «подвійний учитель», що поєднує в собі онлайн-навчання з офлайн-консультуванням, сприятиме оптимізації зворотного зв'язку, підвищенню навчального ефекту, фахової компетенції як фермерів, так і викладацького складу через поєднання теорії з практикою у навчальному процесі та виробництві.

Реалізація виступає важливим засобом збільшення доходів будь-якого виробника сільськогосподарської продукції, якість збутової ланки відбивається на процесі управління всієї сімейної ферми.

Вдосконалено методичний підхід проведення аналізу факторів, що впливають на вибір каналів збуту сільськогосподарської продукції в середовищі «Інтернет+» з використанням моделі логістичної регресії, сформованої на підставі фактичних даних отриманих шляхом анкетування.

На основі середовища «Інтернет+» є багато варіантів для розповсюдження сільськогосподарської продукції її виробниками. Автором оцінено поточну ситуацію з каналами збуту серед сімейних ферм провінції Хенань, зібрано та проаналізовано дані за допомогою вимірювального програмного забезпечення SPSS 22.0, оцінки логістичної моделі та перевірки гіпотез. Зроблено висновок, що сертифікація, бренд і форма бізнесу сімейних ферм мають очевидний вплив на канали їх збуту. Згідно зі статистичними даними, серед каналів збуту сільськогосподарської продукції сімейних ферм провінції Хенань традиційний канал спотової торгівлі все ще є основним. Серед усіх восьми напрямів реалізації Інтернет-канал складає 9,40%, займаючи сьоме місце.

Враховуючи наведені вище результати, визначено, що на основі середовища «Інтернет+», вибір та інновації каналів збуту сімейними фермами в провінції Хенань потребують подальшого вдосконалення. Особливо це стосується мережевих платформ як можливих напрямів реалізації через чинники свідомості, неякісного обладнання, відношення в навколишньому суспільстві. Відповідно, відсутня достатня можливість використання потенціалу Інтернету. Водночас з

великою кількістю якісної продукції, люди поступово змінили «повноцінне харчування» на «хороше харчування» і «здорове харчування». Сільськогосподарська продукція стала трендовою, вибудовуючи свої бренди та отримуючи сертифікати, займає пріоритетне становище в продажах. Сімейним фермам ще потрібно докласти зусиль для посилення створення бренду та сертифікації власної продукції.

Впродовж останніх двадцяти років стрімкий розвиток сімейних ферм призвів до підвищення рівня сільського господарства. Однак через високі ризики агровиробництва, низьку врожайність, тривалий цикл, необхідність розширення масштабів сімейні ферми стають все більш вимогливими і залежними від капіталу. В силу характеру сільського господарства сімейним фермерським господарствам важко виконати умови банківських кредитів, а проблеми з фінансуванням надто обмежують їх фінансові можливості.

З розвитком суспільства Інтернет відіграє важливу роль у різних сферах. Інтернет-фінанси змінили традиційну фінансову модель, розширили канали фінансування та краще задовольнили потреби соціального та економічного розвитку. Як новий тип суб'єкта сільськогосподарської діяльності, фінансування сімейних ферм стикається з обмеженнями, пов'язаними із складністю доступу, високою вартістю фінансування та відсутністю достатньої застави. З розвитком економіки, науки та техніки, широкого поширення набув режим Інтернет-краудфандингу. Завдяки таким характеристикам, як простота використання, низька вартість і відносно прозоре інформаційне наповнення, гарантує розвиток сімейних ферм.

За допомогою окремо сформованої платформи запропоновано до впровадження механізм інтернет-краудфандингу для фермерських господарств, який складається з окремих етапів: створення спеціалізованої платформи, ініціювання і презентація проекту, підбір зацікавлених інвесторів, освоєння інвестицій, визначення фінансового результату, що сприятиме розширенню каналів збуту, вирішенню труднощів фінансування відповідних виробників сільськогосподарської продукції.

У порівнянні з традиційним фінансуванням онлайн-краудфандинг більше підходить для забезпечення фінансовими ресурсами сімейних ферм. Імплементация запропонованих підходів дозволить інтегрувати нагляд за зовнішніми фондами для забезпечення безпеки ресурсів інвесторів, спрямовуючи сімейні ферми на ведення виробничої діяльності стандартизованим способом після отримання коштів.

Поєднавши теорію з практикою, застосувавши стратегію даної наукової роботи на практиці щодо каналів збуту сільськогосподарської продукції, була створена організаційно-практична компонента збуту сільськогосподарської продукції сімейними фермерськими господарствами на основі функціонування «WeChat group» в умовах інтернет продажу.

Ключові слова: аграрний менеджмент, диференціація фермерів, ефективність виробництва, земельна політика, інституційна зміна, інформаційна складова управління, конкурентний механізм, краудфандинг, менеджмент, передача землі, ринковий механізм, розвиток, сільськогосподарська продукція, сільське господарство, сімейна ферма, фермерське господарство, соціальна структура, спроможність сільськогосподарського управління, створення бренду, управління розвитком.

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INTRODUCTION

China has a large population, and the government has permanently attached great importance to agriculture. With the advancement of science and technology and rapid economic development, the secondary and tertiary industries have made significant progress. As the foundation of the national economy, agriculture is also in urgent need of development.

As a typical representative of the "new agricultural management system," family farms play an increasingly important role in the development of China's agricultural modernization, which is essential in ensuring social stability and economic development. However, with the fierce market competition and the lack of innate attributes of agriculture, the disadvantages of the management process of the development of Chinese family farms have gradually emerged.

Family farms are one of the most efficient and reliable production and management methods in agricultural production in the world today. Countries that have achieved agricultural modernization generally adopt family farm production and management methods, which have been proven by the world. With the progress of Chinese society and economic development, the comprehensive ability is also in the stage of rapid rise as the country's foundation, the core position of agriculture cannot be shaken. Because China's agriculture has many weaknesses, the development of agriculture has been hindered to some extent. Finding a new way of action has become an important issue. According to China's current national conditions, family farms as a "new type of agricultural economy" has emerged. Since 2013, family farms have made significant contributions important to China's agricultural development. The emergence of "family farms" as a new system should have a corresponding development management system to serve it. However, many current problems have caused a phenomenon contrary to the development of family farms. It is possible to solve the current issues faced by family farms. It is essential to provide a basis for the development and management of family farms through analysis and research and to improve the management process of family farm development.

The following scientists have made theoretical and practical contributions to improving the management process of family farm development: Agarwal D., Agronomski A., Andersson A., Cavicchioli D., Chen J., Dogliotti S., Dolev Y., Douglas A., Freeland L., Fu Aimin, Gasson H., Gatachew L., Grgic Z., Henderson S., Hoffman A., Ingolf V, Inwood S., Jurfeldt G., Kristof Van Assche, Kong Lingzi, Lagodiienko V., Lan Yong, Li Dongsheng, Liao Yi, Lozynska I., Lukash S., Luo Huanyi, Medina G., Mishra A., Mooney P., Nazarenko O., Odle J., Pasko O., Qiao Bo, Shen Qiong, Skrypnyk S., Smale M., Thompson J., Wilson L., Wu Kaiqun, Xu Caixia, Yu Jianbin, etc. Scientists mainly reflected on the concept, nature, and advantages of family farms and also affirmed the critical role of family farms in agricultural development. However, most of the previous research conducted research and analysis from a single process, not from the management of the development of systematic family farms. They lacked systematic study on the management of the entire plot of family farms in the context of economic transformation. Therefore, the above determined the topic of the dissertation research.

Connection of work with scientific programs, plans, topics. The dissertation was completed by the directions of research work of the Department of Accounting and Taxation of the Sumy National Agrarian University: «Theoretical, methodological and practical aspects of the transformation of formation and audit of accounting and reporting component of management of enterprises (institutions, organizations) in transparent conditions of the innovative economy» 2022-2026 (state registration number 0122U001378), within which, the author investigated the nature of the development of family farms and the current state of their financing, proposed a methodical approach to the analysis of factors affecting the choice of channels for the sale of agricultural products in the "Internet+" environment.

The Aim and Objectives of the study. The purpose of the work is to improve the theoretical and methodological foundations and develop practical recommendations for managing the development of family farms in the conditions of economic transformation.

According to the research purpose, Set the following **tasks**:

- to generalize and clarify the conceptual and categorical apparatus of research on the management of the development of family farms in the conditions of the transformation of the economy;

- analyze the factors affecting financing, identify methods suitable for modern economic development and propose an Internet crowdfunding mechanism for farms;

- to investigate the possibility of using the system of training family farmers through the introduction of the "dual teacher" training mode;

- justify the methodical approach of analyzing the factors affecting the choice of agricultural product sales channels in the "Internet+" environment;

- to consider the strategy of formation of agricultural land use of farms in China;

- to form an organizational and practical component of the sale of agricultural products by family farms in the conditions of economic transformation;

- taking into account the requirements of modern information technologies to investigate a multi-level management system for the development of family farms in China.

The object of the study is the processes of managing the development of family farms in the conditions of economic transformation.

The subject of the research is theoretical and methodological approaches and scientific and applied aspects of managing the development of family farms in the conditions of economic transformation.

Research methods. The theoretical and methodological basis of the research is classical and modern provisions of economic science, and current legislative and normative legal acts. To achieve the set goal and solve problems, a wide list of methodological techniques was used in the work, such as: literature method - read and consult relevant information about the formation and development of family farms; comparative research method – by comparing the development status and development data of excellent family farms in different countries and regions; case study method - to promote self development by analyzing the excellent experience of family farm development and management at home and abroad; compare and graph - through data collation, the data can be represented by graphics, which can obtain more intuitive and

visual presentation effect; historical development method - to study the experience of farm formation and operation in chronological order; investigation and research method - understand the development trend of agriculture and the development status of family farms through field investigation; quantitative research method - through quantitative analysis of survey data, find the weight of influencing factors; practical operation method - for the Internet sales channel of family farm agricultural products, establish a group buying group through WeChat to carry out practical operation to test whether the strategy is successful; induction and grouping - group and summarize the collected data according to the requirements; constructive and experimental - develop management related measures for family farm development; empirical analysis method - analyze and sort out the collected data, conduct empirical research, and analyze the weight of various factors to provide basis for optimizing farm development.

The information base of the dissertation research consists of preliminary information obtained as a result of my own research and observations; publications of Ukrainian, Chinese and international scientists; monographic publications; internal documentation of family farms; official materials of state bodies of Ukraine and China, program documents of regional state authorities and local governments China.

Scientific novelty of the obtained results. The scientific novelty of the obtained research results lies in the development of theoretical and methodological principles and practical recommendations for the formation and functioning of mechanisms for managing the development of family farms in the conditions of economic transformation. The scientific novelty of the most significant results obtained in the research process is as follows:

for the first time:

- with the help of a separately formed platform, an Internet-crowdfunding mechanism for farms is proposed for introduction, which consists of separate stages: the creation of a specialized platform, initiation, and presentation of the project, selection of interested investors, development of investments, determination of financial results and will contribute to the expansion of sales channels, solving difficulties financing of relevant producers of agricultural products;

improved:

- the essence of the definition of "family farming" has been improved, which, in contrast to existing interpretations, means the main production unit, family members - as the main labor force, agricultural income - as the main source, using own or acquired land for the appropriate scale of specialized, commercial, socially oriented agricultural production;

- a multi-level management system for the development of family farms in China, which made it possible, taking into account world experience, by implementing informatization as a significant component, to determine the features of the functioning of this component of agricultural production for the future: state regulation, receipt of social services, circulation of agricultural land, education of farmers, search sources of financing, building your own brand;

- a training system for family farmers through the introduction of the "dual teacher" training regime, which combines online training with offline counseling and contributes to the optimization of feedback, increasing the educational effect, and professional competence of both farmers and teaching staff through the combination of theory with practice in the educational process and production;

- a strategy for the formation of land use of farms, the implementation of which will contribute to standardization of the land transfer procedure in accordance with the current legislation, strengthening of publicity of the policy and rules of land transfer in rural areas, creation and improvement of the system of financial service of agricultural lands; strengthening the information service of intermediary organizations, increasing competition during the introduction of the market mechanism of land circulation;

- a methodical approach to analyzing factors affecting the choice of agricultural product sales channels in the "Internet+" environment using a logistic regression model formed on the basis of actual data obtained through questionnaires;

acquired further development:

- the organizational and practical component of the sale of agricultural products by family farms based on the functioning of the "WeChat group" in the conditions of Internet sales.

Practical significance of the obtained results. The practical significance of the obtained research results lies in the development of scientifically based recommendations for the effective management of family farms in the conditions of economic transformation. By combining theory with practice, and applying the strategy of this work in practice for agricultural sales channels, an online purchasing group was created that helps family farms sell agricultural products and increase their income.

Signed the WeChat group purchase plan and agreement with "Nongle" Family Farm. This project was approved by the WeChat Business Association of Xinxiang City, Henan Province, project application number: 4120200215, and was approved on January 1; 2020.

From January 2022 to now, the "Double Teacher" teaching system has been used to carry out five farmer training sessions, with 82 sub-sessions, training more than 2,300 new professional farmers. The author participated in the development and teaching process of the "double teacher" teaching system, promoting the improvement of the comprehensive quality of family farmers.

The main provisions, conclusions, and proposals of the dissertation have been brought to the level of scientific and methodical recommendations, which have been tested and accepted for implementation.

The applicant's personal contribution. Dissertation research is an independent scientific work of the author. Scientific results, conclusions, and proposals submitted for defense were obtained by the author personally.

Approbation of the results of the dissertation. Ukrainian Conference on Science and Practice. Part 2 «Practical Problems and Prospects of Accounting, Analysis and Control Development in Social-Oriented Enterprise Management System» (Poltava, April 23; 2019); International Scientific and Practical Conference «21st Century Management: Globalization Challenges» (Poltava, 23-24.04 2019); The scientific and practical conference of teachers, graduate students and students of the Sumy National University (Sumy, 17-20.04, 2019); International Scientific and Practical Conference «Entrepreneurship in the agricultural sphere: global challenges and effective management». (Zaporizhzhia, February 12-13, 2020); The All-Ukrainian scientific and

practical conference dedicated to the 60th anniversary of the Department of Accounting and Taxation of the Ukrainian State Academy of Sciences. «National and global trends in the development of accounting, taxation and control» (Odessa State Agrarian University May 21, 2020); The XI International Science Conference «Implementation of modern science in practice», (November 29 – December 01, 2021, San Francisco, USA).

Publication of obtained results. The main scientific provisions and results of research on the topic of the dissertation have been published in 16 scientific papers, including 5 articles in specialized scientific publications of Ukraine, of which 5 are included in international scientometric databases; 1 individual chapter in an international collective monograph; 2 articles in periodicals of other countries included in the scientific and metric database Scopus or Web of Science (including 1 article in a publication assigned to the third quartile (Q3), according to the SCImago Journal and Country Rank classification); 1 article was published in scientific periodicals of other OECD countries; 7 theses in materials of scientific conferences. The total volume of publications is 8,83 printed sheets, of which 7,15 printed sheets belong to the author personally.

Scope and structure of the dissertation. The work consists of an introduction, three chapters, conclusions, and suggestions, laid out on 153 pages of the main text, including 31 tables and 36 figures. The list of used literary sources contains 216 titles.

SECTION 1

THEORETICAL AND METHODOLOGICAL BASIS OF MANAGEMENT OF FAMILY FARM DEVELOPMENT

1.1 The essence of the development of family farms

With the rapid development of China's urbanization and industrialization, a large number of rural surplus labor force influx into the city, rural land has been abandoned in an extensive range; agricultural production has become a part-time form of migrant workers in many places. Correspondingly in the rapid development of urbanization and industrialization, China's agricultural modernization process is relatively lagging [1]. How to promote the process of agricultural modernization and ensuring the food security of the country is a problem we must think about and face. As a new type of agrarian economy, the family farm has become a new type of economic organization suitable for China's agricultural development. This dissertation mainly combs the basic concept and connotation of "family farm" to determine the specific purpose [2].

In China, "family farm" is a typical foreign word, which is understood differently in China and Europe, and America. First of all, the understanding of "farm" is not the same, especially the knowledge of developed countries focuses on business entities, which is not necessarily related to the size of the area [3]. However, the definition of the family farms in China differs from the decentralized management of ordinary farmers in terms of technology and scale [4]. The U.S. Department of Agriculture has defined the concept of "family farm" in an authoritative way. This standard has been recognized by many countries, mainly including the ability to produce and sell agricultural products, and the farm products must exceed the scope of the community. Income can be obtained to cover the cost of family and farm operations, including production costs and real estate maintenance costs. The main labor source of family farm is farm and family members. Family farmers need to be responsible for the decision-making and management of farm production and sales. Hire the workers on a seasonal basis or on a permanent basis.

In 2018, the concept of "family farm" was first proposed. After nearly 15 years of development, family farm has become an important part of China's agricultural development [5]. Family farms are playing an important role in the development of China's agricultural modernization, which is conducive to the realization of agricultural scale management, can well promote the development of agriculture, and can also encourage farmers to increase their income [6]. Especially since 2013, China's family farms have developed rapidly, the overall number has increased rapidly, and the quality of development has been continuously improved, which has a very obvious driving effect on the agricultural and rural economy. The number of family farms registered nationwide has exceeded one million by the end of June 2020. As an effective way to change the mode of agricultural development and an important part of the construction of modern agricultural management system, family farms have been supported and promoted by governments at all levels in recent years [7]. The Ministry of Agriculture of China has also issued the identification standards for family farms (Table 1.1). After the Ministry of agriculture proposed the identification standards for family farms, some local governments have also formulated the identification standards for family farms in various regions [8].

Table 1.1 - Chinese Ministry of Agriculture for family farm appraisal standards

Project conditions	Specific standards
1	2
Registered residence requirements	The operator should have the registered residence of the village and be mainly engaged in agricultural production.
Labor requirements	Farm operators and their family members are the main labor force. If labor force is employed, the continuous working time of a year cannot exceed 6 months.
Income requirements	The agricultural income or comprehensive agricultural income of family farms should account for more than 80% of their whole family income.
Scale requirements	For those engaged in the cultivation of grain crops, the contract period must be more than 5 years. The local minimum standard for two or three crops a year is 3.33 hectares, and the local minimum standard for one crop a year is 6.67 hectares. For those engaged in cash crops, planting and breeding combination, aquaculture and circular agriculture, their scale is stipulated by the competent agricultural department at the county level.
Operator requirements	The operator has certain agricultural experience and needs to participate in the agricultural technology training organized by the competent agricultural department.
Financial requirements	Family farms should maintain independent financial records and can hire accountants

Continuation of table 1.1

1	2
Radiation effect	It can promote the employment of ordinary farmers and play an exemplary role in the adoption of new technologies, new varieties and the use of new machinery.

Data Sources: <http://www.moa.gov.cn/index.htm>. [9]

From the scholars' research on the connotation of the development of family farms, there are definitions of authoritative departments and analyses of scholars. Through research, Mann A, Dickinson J. believe that external factors, such as freshness of agricultural products, flexibility of labor, employment of labor, utilization of fixed assets, and profitability have create and sustainable development of family farms [10]. Through research, Gasson and Errington. A found that the family farm is a business unit with the unity of owner and operator. Its family members are mainly engaged in agricultural production activities. At the same time, the farm provides family members with the funds needed for production and life, and its ownership and management rights will be continuously inherited from generation to generation [11]. Jurfeldt G believes that family farms are the aggregation of three relationship units: production, consumption and relatives[12]. Reid. D believes that the development of family farms must depend on family members, and family members make decisions together. The inter-generational inheritance of farms is crucial to the development of family farms [13]. Calus. M studied Belgian family farms, the total assets of family farms have a significant positive impact on the smooth inheritance of family farms. The greater the absolute value of total assets, the smoother the inheritance of family farms will be [14]. Borec and Rejetal believe that the inheritance of family farm operators means that the previous generation will pass on the comprehensive knowledge, professional knowledge, management experience, production skills, farm ownership and farm management rights to the next generation through the study of family farms in Slovenia, and the vast majority of family farms in this region can be developed smoothly [15]. Based on the international financial reporting standards, the farm's correct selection of accounting information technology will allow. It is appropriate to include the possibility of improving the efficiency of management decision-making, because the indicators prepared for the formation of general financial

reports are the basis for dealing with an important part of the internal financial information of the farm [16]. Individual economic entities obtain financial and economic benefits: it is easier to enter the capital market, improve the existing relationship with the public, and may reduce the cost of capital. At the same time, It can be processing, storing a large amount of accounting information and sampling, minimizing the need to save paper documents, analyzing activity indicators, planning and forecasting for the future, accumulating relevant data and ensuring the possibility of round the clock access of final stakeholders from their workplaces, which will help the realization of business in real-time conditions [17].

China research on family farms started late, dating back to the early 1980s. At that time, the concept of "family farm" was used abroad, and it is considered to be an institutional innovation superior to the traditional production mode. However, due to the limitations of the productivity level, market environment and the development level of agricultural science and technology at that time, the so-called family farm at that time was mainly a state-owned farm "with family members as the main production body", which strictly speaking did not meet the definition of today's family farm [18]. Representative documents include: Wang Gang and Quan Guangming analyzed the actual development of family farms in China at that time, and believed that in view of the current situation of agricultural development at that time, there were many urgent problems in the cultivation and development of family farm system [19]. Li Huian analyzed the similarities and differences between the family farm system and the traditional model, and analyzed the advantages of the production relationship with family members as the main body over the traditional production model [20]. Lin Yifu compared and analyzed the advantages and disadvantages of the family responsibility system and the people's commune system, family farms have significant advantages. Farmers work for themselves and have high initiative and enthusiasm, which solves the problem of supervision and incentive in agricultural production [21].

After 2000, the development of family farms has become more diversified and dynamic, and the corresponding research is increasing. In combination with the national conditions, Yin Kunhua proposed that the development of modern agriculture in China

should mainly establish family farms that can adapt to modernization, specialization and intensive management and are responsible for their own profits and losses. Accordingly, it is necessary to establish a double-layer property right system of rural land based on social ownership and owner ownership [22]. Chen Jiping and Liang li believes that agriculture in a narrow sense has strong natural life characteristics, which is reflected in the low level of division of labor and the weak complementarity between labor and other elements [23]. That family is a more effective form of agricultural production organization than modern enterprises. An important reason for China's slow agricultural development is the lack of space for rural labor transfer, which affects the process of agricultural mechanization. Agricultural industrialization is not an effective way to solve China's agricultural development [24]. The main behavior of farmers is the endogenous driving force demand leading to the institutional innovation of family farms [25]. Based on Marx's theory of institutional change and North's theory of institutional change, Wu Kaiqun and Lin Qiong believe that scale management, technological progress and professional division of labor constitute the internal causes of the institutional change of rural family farms [26]. The central government, local governments and rural families are the main bodies of the institutional change of family farms, Rural families' pursuit of external benefits is the external motivation for the institutional change of family farms [27]. Based on the case study of family farms in central Anhui Province, Yang Chenglin analyzed the characteristics and formation mechanism of Chinese family farms, and concluded that the fundamental driving force of the formation of family farms is the spontaneous response of farmers to economic incentives [28].

The role of the government mainly lies in how to clear the obstacles for this generation, so as to reduce the "transaction costs" that farmers spend in the process of its generation. At the same time, reduce the operational risk of agriculture and make agricultural production more predictable [29]. Feng Kaiwen systematically analyzed the history of Xinjiang Province stablishing family farms in state-owned farms in the early stage of reform, and believed that the key reason for the rise of family farms was the low efficiency of the state-owned farm system. A new approach to agricultural development is needed [30]. Wang Zhen believes that family farms can be traced back to the

development of state-owned farms and employee family farms, and deeply reveals the internal logic behind the emergence and evolution of Chinese family farms from the perspective of institutional change [31].

The property right nature of family farms, a problem that cannot be avoided in the development of family farms is the property right of family farms. It is particularly necessary to correctly understand the property right nature of family farms [32]. Coase Theorem once pointed out that clear property rights are a prerequisite for market transactions [33]. Coase once said that clear property rights are the premise of market transactions, because the clarity of property rights is related to the size of market transaction costs [34]. The organizational nature of family farms, organizations are two or more people together to achieve a common goal and the collective action [35]. Family farm is a new type of agricultural management organization form, which takes the family as the basic production and management unit, takes the appropriate scale of land as the foundation, and carries out agricultural intensive production and commercialized management in an entrepreneurial way.

At present, scholars differ greatly on what kind of organization family farms are. Many scholars believe that family farms implement commercialized production with the goal of maximizing profits, so their organizational nature is defined as enterprises [36]. By analyzing the constituent factors of the enterprise, we can analyze whether the family farm belongs to the enterprise organization. Yang Xiaokai believes that an enterprise is composed of three elements: First, employers and employees have asymmetric control over earnings; second, employers have control over residual earnings; third, products are sold to the market [37]. From Yang Xiaokai's definition of enterprises, it is obvious that enterprises should be mainly operated by employees, while most family farms in China are mainly operated by family members, not by employees. Therefore, in most cases, there is no residual control asymmetry between employers and employees. Although the family farm implements commercialized production, only meeting this condition does not mean that the family farm is an enterprise organization. Of course, if the business scale of family farms is expanded to rely entirely on hired workers, family farms may evolve into agricultural enterprises [38]. Family farms are new agricultural management

organizations that carry out agricultural intensive production and commercialized management in an entrepreneurial manner. The essence of socialist agricultural transformation is that socialized large-scale production replaces small-scale production of natural economy [39]. Not just the expansion of scale. Employees can only obtain the required means of livelihood by selling labor [40]. In many family farms, there is also a situation that farmers transfer the contracted land to farmers for management and then employ themselves in family farms [41]. Farmers can not only obtain income from land transfer, but also obtain income from labor [42]. The United States is a country with fewer people and more land. The plain area accounts for more than 55% of its land area, and the per capita cultivated land area reaches 0.733 hectares, while the agricultural labor force only accounts for about 2% of the total population of the country [43]. How large should family farms be? Family farm is a large-scale operation, seeking the scale benefit most. But there is no clear standard for the scale [44]. China must combine land scale with agricultural output rate and labor productivity, pay attention to the relationship between labor productivity and agricultural output rate and land scale, and cannot expand the scale indefinitely [45].

Improving the management of family farm development is an effective measure to achieve intensive agricultural management and promote sustainable agricultural development [46]. Intensive agriculture is a management method in agriculture. The purpose of intensive management is to obtain more agricultural products from a unit area of land and to continuously improve land productivity and labor productivity [47]. China's agricultural production is relatively inefficient, the land utilization rate is not high, and the production method is relatively traditional, we cannot achieve large-scale production [48]. Therefore, it is necessary to take the road of intensive management. The development and management of family farms have the characteristics of market-oriented enterprise, which can better maintain and protect agricultural productivity and achieve sustainable agricultural development [49].

Under the current situation, agricultural intensive management has become an inevitable trend of agricultural development. Only by implementing appropriate scale management of land and improving the level of intensification can the development of

modern agriculture be accelerated and the output benefits of land be fully exploited. [50]. The development and management of family farms can optimize labor organization, promote the reform of production methods, scientifically allocate productive forces, and at the same time make labor relations better adapt to the development of productive forces, and can make the circulation [51], combination and consumption of production materials more reasonable, forming a new Intensive Productivity [52]. The management of family farm development plays an important role in agricultural [53]. Family farms are conducive to the scientific of agricultural production and improve agricultural labor productivity. Only in family farms with relatively concentrated arable land can unified planning and rational layout be carried out for agricultural science and technology that requires large-scale promotion [54]. Which is conducive to machine cultivating and machine sowing and farmland sprinkler irrigation. Family farms need science and technology more than scattered farmers, because the adoption of technology can obtain higher benefits through the scale management of family farm development management [55]. The cultivation and existence of new professional farmers requires specific carriers. The most ideal carrier is family farms, and the workers on family farms are typical professional farmers. Only the formation of family farms can stimulate the demand for agricultural science and technology, and is conducive to the accumulation and transfer of professional farmers' production experience [56]. At the same time, the management of the development of family farms can attract a group of aspiring young people to invest in agriculture for life, In the process of production and operation of family farms, new-type farmers with culture, technology and management skills can be cultivated [57].

The management of family farm development is an effective carrier to increase the effective supply of agricultural products and ensure the quality and safety of agricultural products. It is an important measure to promote the development of rural agriculture. The management of family farm development is an effective carrier to increase the effective supply of agricultural products and ensure the quality and safety of agricultural products [58].

Through sorting out, many authors have put forward research on agricultural informatization and family farm informatization management, and the results mainly

focus on: Feng Qingshang and Wang Gang believe that the agricultural informatization construction in Guangxi is led by the government and the market is perfect [59]. It is necessary to improve farmers' awareness of informatization, enhance farmers' desire to obtain agricultural product sales information, train professional information managers, and strengthen scientific research on agricultural informatization and others [60]. Guo L.P analyzed the current situation and characteristics of agricultural informatization in the world leading countries such as the United States, Germany and France, and concluded that the development of agricultural informatization in foreign countries has advantages such as solid foundation, sufficient funds and perfect systems [61]. Lu K and Zhang H.J studied the development status and trend of e-commerce in Sichuan fresh fruit industry, and started from expounding the necessity of developing e-commerce in Sichuan fresh fruit industry. After discussing the existing problems in developing e-commerce in Sichuan fresh fruit industry, he proposed the development principles of e-commerce in Sichuan fresh fruit industry, and analyzed the development trend of e-commerce in Sichuan fresh fruit industry [62]. Zou D.M analyzed the impact of e-commerce on China's fresh fruit industry, the types of e-commerce for fresh fruit, and the difficulties in developing e-commerce for fresh fruit from two aspects of market structure and marketing strategy. The utility theory is introduced to analyze the sales mode of e-commerce of fresh fruit, and the meaning and influencing factors of the probabilistic sales of e-commerce of fresh fruit based on the utility theory are emphatically analyzed, as well as the applicability of the probabilistic sales mode of e-commerce [63].

In the family farm information management. Fang X.M believes that in the field of family farm informatization, the United States has always been at the forefront of the economic and social development of family farms in the world. The United States has invested a lot of time, human, material and financial resources in the research and promotion of modern family farm information technology and family farm informatization, and has built a complete family farm information database and a modern family farm information management network system, It is provided to family farms for free, which promotes the rapid and healthy development of American family farms [64]. Ruan R, Zhou P and Zheng F believe that in order to realize the informatization of family

farms, it is necessary to improve the information acquisition ability of family farm operators, expand the information acquisition channels, pay attention to the information needs of family farm operators, and improve the matching of information supply and demand [65]. Li J, Getachew L and Sonnino .R studied the application and development strategy of family farm information. They believes that the promotion of information technology has certain regional differences [66]. Due to the different development level of productivity and economic development of each city or region, these factors directly affect the promotion and popularization of information technology on local family farms and the development of information technology on local family farms [67]. Therefore, the comprehensive application of family farm information technology needs to be combined with specific reality [68]. In analyzing the relationship between agricultural informatization and agricultural economy in Henan, Ding L.M said that agricultural informatization has the attribute of public goods, and its construction can only be led by the government, which requires the government to increase the support for infrastructure construction funds, and at the same time, formulate a scientific agricultural informatization system [69]. Zhang Y pointed out that improving farmers' information awareness and information science and technology level is the core of rapidly promoting family farm information work by analyzing the path of Hubei new rural construction [70]. Shang Jie said in the analysis of Anhui Province family farm informatization construction, according to the case analysis, at present China's family farm informatization development is still short of high-tech talents, information management talents and high-quality comprehensive talents [71]. Fu W.D, Wang J pointed out that the main problem of China's agricultural information market is the low market allocation rate, which is mainly caused by the failure of reasonable setting of hardware, software and personnel training in the process of agricultural informatization [72]. Kong X.Z believes that in the process of agricultural informatization in China, most of the energy and funds are used to build hardware and software facilities, and the importance of talent training is not recognized, which makes many farmers not interested in informatization achievements. Therefore, how to improve the efficiency of informatization achievements is an urgent problem to be solved [73]. Jack.O believes that family farm is an agricultural operation

entity with an appropriate scale engaged in agricultural production, processing and sales based on the basic unit of peasant households, registered by the industrial and commercial administration department, market-oriented and profit maximization [74]. Aker D believes that family members must live on the farm, raise funds for the family farm, and the family members of the farm work together in agriculture [75].

Through the study of family farms around the world, the dynamics of the formation of family farms are mainly concentrated in the following aspects. Huang Zongzhi and Shucksmith M. believe that the emergence and formation of family farms in China should be explained from three aspects: the driving force of institutional change, the institutional environment and China's basic national conditions [76]. From the perspective of the driving force of institutional change, under the dual pressure of the government and the market, ordinary farmers have the driving force into evolve to family farms [77]. Dong Yazhen and Bao Haijun believe that family farms are more in line with China's basic national conditions and realities, and have unique advantages that enterprise operations do not have [78]. Wu kaiqun and Sippel S. R believes that having an obvious advantage in market transaction costs is the main reason for the emergence and development of family farms. Family farms are a kind of production relationship that adapts to the current productivity development. The reason why they adapt to the current institutional environment is not only the result of induced institutional changes [79], but also the result of farmers' active choice in order to achieve the objectives of stabilizing the price of agricultural products, reducing business risks, increasing agricultural income [80]. The dual pressure of the government and the market, and the labor market system based on professional division of labor; Stable and clear farmland property rights; Land system that can be scaled and centralized; The improvement of agricultural socialized service system [81]. Specific historical background and legal basis of agricultural policy. The advantages of family farm management over small-scale farmers and agricultural enterprises [82]. Theodore S point the family farm has obvious advantages in market transaction costs and the improvement and implementation of national policies and systems. The result of the coupling of government promotion and farmers' spontaneous will [83].

In addition, some scholars have proposed that the formation mechanism of family farms should be systematically understood from the two aspects of institutional supply and institutional demand. Catherine Guirkinge and Jean Philippe made an empirical analysis of the development of family farms in western Africa, which showed that under the general environment of industrialization, urbanization, agricultural scientific and technological progress and the deepening and accelerating process of marketization, the agricultural management system of small farmers has the pressure of change from the external environment, There are also incentives and demands to form new institutional forms [84]. Fernandes and Woodhouse studied the formation and development of family farms in southern Brazil from the perspective of micro-farms, meso communities and regional macro scope, from the three dimensions of economy, society and ecology, and selected five elements: natural resources, financial capital, material capital, human capital and social capital. They believed that government support was an indispensable factor in the formation of family farms in southern Brazil [85]. Vidal D. L believes that women play an important role in the formation of family farms, but for a long time, government policies, technical training and other services are mainly aimed at male farmers and ignore women, which has affected the smooth formation of family farms [86]. The balance between supply and demand of the market is the fundamental factor in the formation of family farms [87]. The internal driving force for the formation of family farms lies in the specialized management of agricultural land, the gradual progress of technology and the formation of a specialized division of labor pattern. In contrast, the external reason for the formation of family farms lies in farmers' pursuit of profits. National mandatory institutional changes and farmer-induced institutional changes are combined to jointly promote and realize the emergence of family farm system [88]. As a new type of agricultural management organization, family farms emerged. Not only maintained the advantages of family management in agriculture, but also abandoned the small-scale farmer management model. It is another innovation of the rural basic management system based on the household contract responsibility system [89]. Li and Liu believes that the family farm system comes from the form transformation on the basis of family management, system innovation on the basis of modern agriculture [90], professional

orientation on the basis of farmers' differentiation and social service on the basis of unified management [91]. Zhang Jianlei analyzed the formation of family farms in a county from a micro perspective and pointed out that the formation of family farms in the county was mainly driven by large grain farmers, agricultural enterprises and farmers' Entrepreneurship. [92]. The generation of family farms depends on the coordination of market supply and demand between farmers and customers. Scale management, technological progress, professional division of labor and so on constitute the internal motivation of family farm institutional change [93]. Farmers' pursuit of external profits is the external motivation of family farm institutional change. National mandatory institutional change is combined with farmers' induced institutional change, Jointly promoting and realizing the emergence of family farm system [94]. Li Qiao pointed out that understanding small farmers is the premise of transforming small farmers. Only by meeting the interests of farmers in the process of socialization can we promote the emergence and development of new agricultural business entities such as family farms [95]. Dong Lingfang based on Giddens' theory of opportunistic structure, believes that the family farm system is not a static structure, but a structured process, that is, the structure is reproduced in the continuous interaction between various actors and the structure. In the repeated interaction and structural reproduction, the structure gradually has the characteristics of stability, forming the family farm system, which is only a temporary stable state, We will continue to interact with actors in the new practice, constantly adjust and change, and adapt to the needs of actual development [96].

To sum up, the existing research on the formation of family farms analyzes the reasons for the formation of family farms from multiple perspectives, but there are many generalizations from the micro perspective, and there is a lack of interpretation from the perspective of macroeconomics. On the basis of the existing research results, we can understand the internal mechanism of the formation of Chinese family farms from the perspective of new institutional economics.

Based on the above analysis, this dissertation defines the concept of family farm as: family farm is both family production and management and social production and management, which conforms to the characteristics that agricultural production is the

unity of natural reproduction and economic reproduction. It is a new type of agricultural business entity that takes peasant households as the basic production unit, family members as the main labor force, agricultural income as the main source, uses household contracted land or transferred land for appropriate scale management, and realizes agricultural commercialization, socialization and intensive production and management.

1.2 Features of managing the development of family farms in modern business conditions

Currently, most western developed countries in the world still adopt the family management system in their farm management. Why the vitality of family farm management system is so tenacious has greatly attracted the attention of scholars all over the world. The following are the relevant comments of domestic and foreign scholars on the operational advantages of family farms.(Table 1.2)

Table 1.2 - Comments of domestic and foreign scholars on the operational advantages of family farms

№	Author, source	Advantages of a family farm operation
1	2	3
1.	Gary .B. [97, p.275-279]	Family farm workers will first decide the optimal production mode, and then optimize their consumption according to their income
2	Raup. [98, p.68-92]	Families have control over labor, land (including ownership) and other factors
3	Alueck Y [99, p.343-386]	The natural attributes of agriculture and crops inevitably increase the cost of monitoring agricultural production. The greater the cost, the greater the need for the existence of family farms
4	Fu A.M Wang G. [101, p.14-16]	Family farms are beneficial to the improvement of agricultural efficiency, the promotion of new technologies and products, the realization of economies of scale, the cultivation of rural modern consciousness, the construction of rural infrastructure.
5	Feng Z. Wang J. [102, p.50]	Family farms break the closure, give full play to the mobility of labor, capital, information and technology, realize the intensive use of land functions, and make farmers change from labor to human resources, which can not only maintain family affection, but also save market transaction costs.
6	Li Y.L [104, p.109-132]	It is believed that compared with the farm management of hired workers, the family farm management is more efficient, and it is easier to formulate a strict production and management plan and implement it well

Continuation of table 1.2

7	Zhu Q.Z [103, p.159-166]	The development of family farms has advantages in the application of agricultural science and technology, the protection and sustainable use of cultivated land, agricultural intensive, specialized and organized production, the implementation of government policies to support agriculture, and the inheritance of agricultural culture
8	Lipton.M. [100, p.45]	The motivation of family farm owners to produce is not to pursue their own benefits or maximize utility, but to avoid risks.
9	Xu Y. [105, p.59-72]	The development of family farms is characterized by the continuity of management mode, the adaptability of productivity development, and the periodicity of farm scale.

Data source: formed by the author on the basis of sources

Foreign family farms have experienced hundreds of years of development. However, China's family farms started late, the relevant policies and regulations are not perfect, the implementation of family farms in China has no experience for reference, is still in the exploratory stage. Based on China's development situation. Taking family farms in France, the Netherlands, Britain, the United States, Japan and Ukraine as examples, and taking the management experience of family farms in excellent regions in China as examples, this dissertation determines the characteristics of managing the development of family farms under current commercial conditions [106].

According to the experience of the United States, The number of American farms increased in the early stage, reaching a peak of 6.8 million in 1935. From 1960 to 1990, the number of American farms decreased (Figure 1.1), but the scale of farms gradually increased, which was more conducive to mechanized and large-scale production [107]. However, it has stabilized since 1990, which confirms that the development of family farms has gradually matured [108].

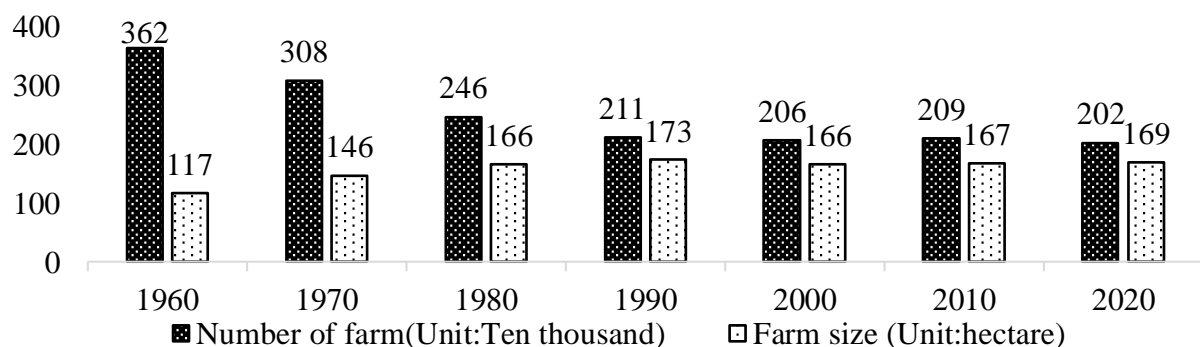


Figure 1.1 - Number and scale of farms in the United States

Data Sources: <https://usdasearch.usda.gov/search?affiliate=usda&query=farm>. [109]

According to statistics, there were 2.01 million farms in the United States in 2020, including more than 1.96 million family farms, accounting for 97.6% of the total number of farms. In terms of scale, the average area of family farms in the United States is about 169 hectares. Among the 2.01 million farms, there are more than 200000 farms with less than 5 hectares, accounting for 10.2% of the total, more than 560000 farms with 5 to 20 hectares, accounting for 27.9%, more than 630000 farms with 20 to 70 hectares, accounting for 31.3%, more than 330000 farms with 70 to 200 hectares, accounting for 16.3%, 130000 farms with more than 200 hectares, accounting for 6.4%, and more than 160000 farms with more than 800 hectares, accounting for 7.9% (Figure 1.2).

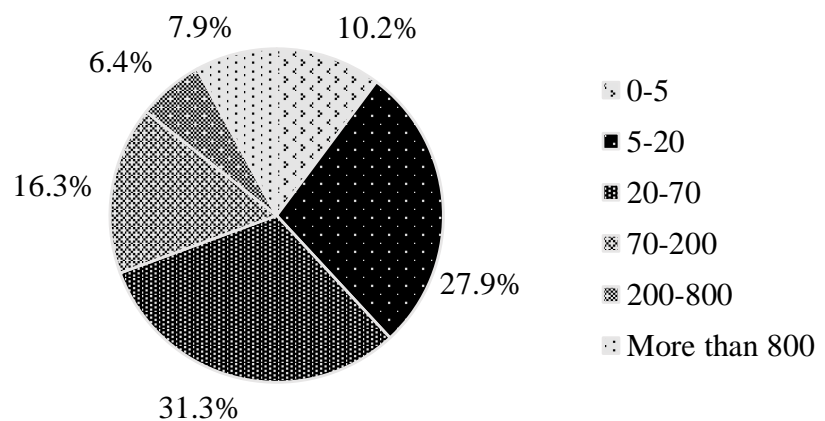
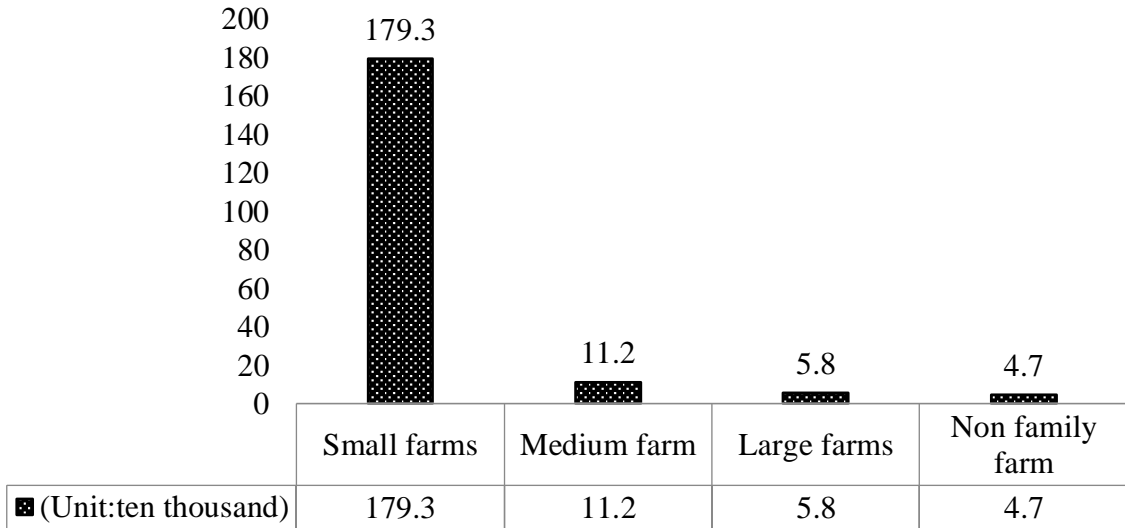


Figure 1.2 - Size of family farms in the united states (Unit: hectare)

Data Sources: <https://usdasearch.usda.gov/search?affiliate=usda&query=farm>. [109]

According to the latest American family farm report, "diversified family farms in the United States (2021)", According to the total cash income, as of 2020, the United States has about 2.01 million farms, of which 97.6% are still family farms. Among them, the total number of small family farms is 1793000, accounting for 89.2% of the total number of farms in the country; The number of medium-sized family farms is 112000, accounting for 5.6% of the total number of farms in the country,; The number of large family farms is 58000, accounting for only 2.9% of the total number of farms in the country [110]. In addition, there are 47000 non-family farms, accounting for 2.4% of the total number of farms in the country (Figure 1.3).



■ (Unit:ten thousand)

Figure 1.3 - Distribution of American family farms by total cash income

Data Sources: <https://xw.qq.com/cmsid/20220401A0BXZL00>. [111]

In terms of area proportion, small farms account for 48.3% of the national agrarian land area, medium-sized farms account for 21.6% of the national agrarian land area, large farms account for 23.6% of the national agrarian land area. Non family farms account for 6.5% of the national agricultural land area (Figure 1.4).

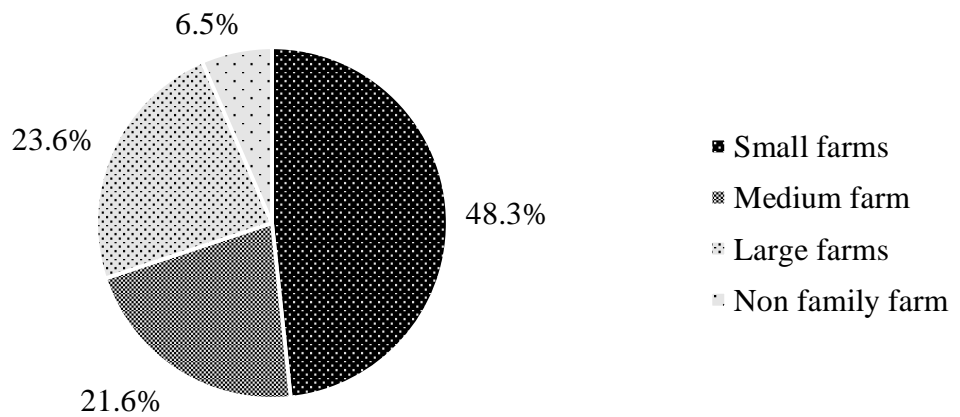


Figure 1.4 - Proportion of family farms of different sizes in the United States

Data Sources: <https://xw.qq.com/cmsid/20220401A0BXZL00>. [111]

In 1776, after the founding of the United States after the war of independence, the United States mastered the ownership of the vast majority of the country's land through

national power [112]. The family farm system has also become the most efficient and primary form of operation in American agricultural production [113]. Due to the leadership of the U.S. government, the number of family farms has been reduced. But the operation scale of farms has been expanding, which has realized the overall improvement of agricultural technology and the improvement of mechanization level, thus improving the agricultural productivity of family farms [114]. The United States established and improved agricultural laws and regulations, and the United States passed the agricultural credit law. This Law provides financial allocation for the benefit groups and protects the interests of all parties [115]. Establish a sound credit protection mechanism for family farms, and establish a farm owner's home Authority, which covers every state for the new family farm operators [116].

French experience. Vigorously promoted agricultural modernization through a series of policies and measures, such as land concentration policy, agricultural structure adjustment policy, agricultural credit policy, agricultural product price subsidy policy, agricultural science and technology policy, market policy and so on [117]. In 1955, France had 2.285 million farms, with an average land size of 14.88 hectares. By 2020, there are only 389,000 family farms left in France, but the average farm area will increase to 69 hectares (Figure 1.5). Farms gradually realize large-scale operations.

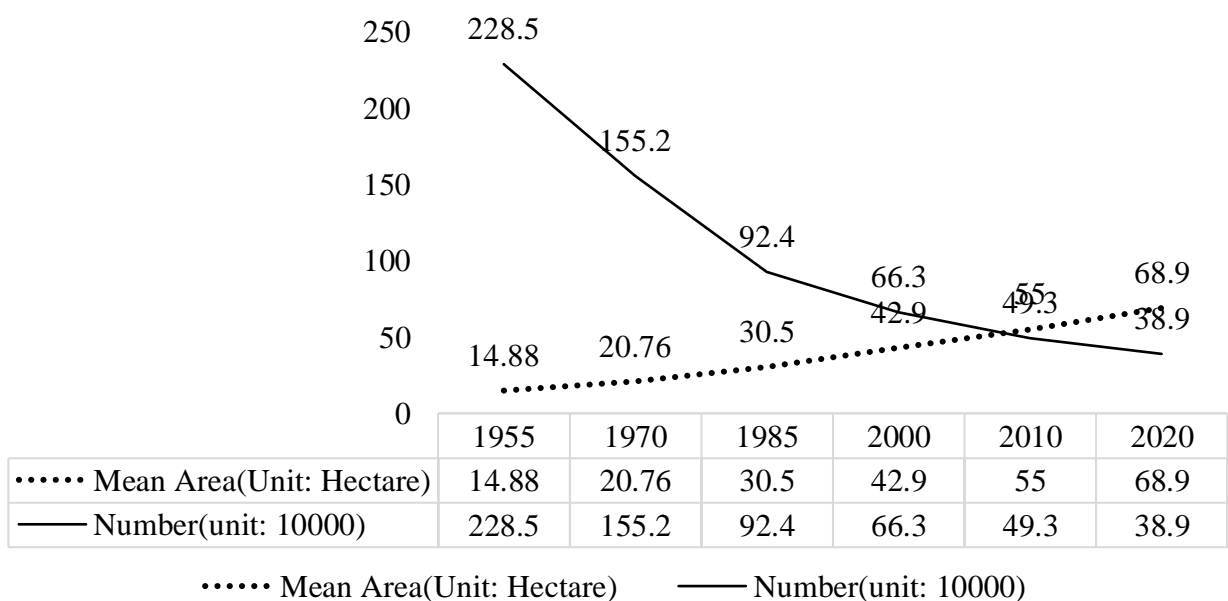


Figure 1.5 - Number and average area of farms in France from 1955 to 2020

Data source: literature data collation.

Family farms and agricultural cooperatives are closely linked. Agricultural cooperatives are established on the basis of family farms and provide a series of agricultural services for farms [118], such as the purchase of means of production, production technology guidance, the establishment of quality standards, agricultural information consultation and so on (Appendix A). Under the premise of retaining private ownership and independent management rights, agricultural cooperatives and family farms have formed an independent and cooperative two-tier management structure [119].

The government attaches importance to and policy support, and increases agricultural support policies. Promote the large-scale management and centralized management of French family farms. In order to promote the rapid development of French agriculture, the French agricultural department has issued a series of relevant policies on the development of family farms, increased the management of the land market, guided the standardization of land circulation, reduced the cost of circulating land, improved the farm land management structure, centralized treatment of scattered land, and realized large-scale management. France has given strong support to farmers to finance family farms. The three levels of credit banks respectively have national, regional and local vaults to adapt to their development [120].

Experience in the development of family farms in the Netherlands. The Netherlands is located in the northwest of Europe, with a land area of 42000 square kilometers, a small land area and a total population of 17.4 million. In 2019, Dutch agricultural exports reached a new high, with a total value of 94.5 billion euros, an increase of 4.5% compared with 2018 (90.4 billion euros), an increase of 45% compared with 2008. About two-thirds of the reasons for the record-high export are due to the rise in prices, and about one-third are due to the increase in export volume [121].

The import of agricultural products from the Netherlands also set a new record in 2019, with a total of 64.1 billion euros, an increase of 3.7% over 2018 (61.8 billion euros) and 54% over 2008. Price and import volume accounted for half of the increase in import volume. The Netherlands has always been a net exporter. In 2019, the Dutch trade surplus exceeded 30 billion euros (30.5 billion euros) for the first time, an increase of 6.6% over 2018 (28.6 billion euros) and 29% over 2008 (23.6 billion euros). The total import and

export trade value of agricultural products in the Netherlands (Figure 1.6). Germany is a major exporter and importer of agricultural products from the Netherlands. 76% of its agricultural products are exported to EU member countries. The leading exporters of non-EU member countries are China, the United States, Senegal and so on. Except for Germany, other EU member countries and non-EU member countries account for half of the import source countries of agricultural products (Figure 1.7).

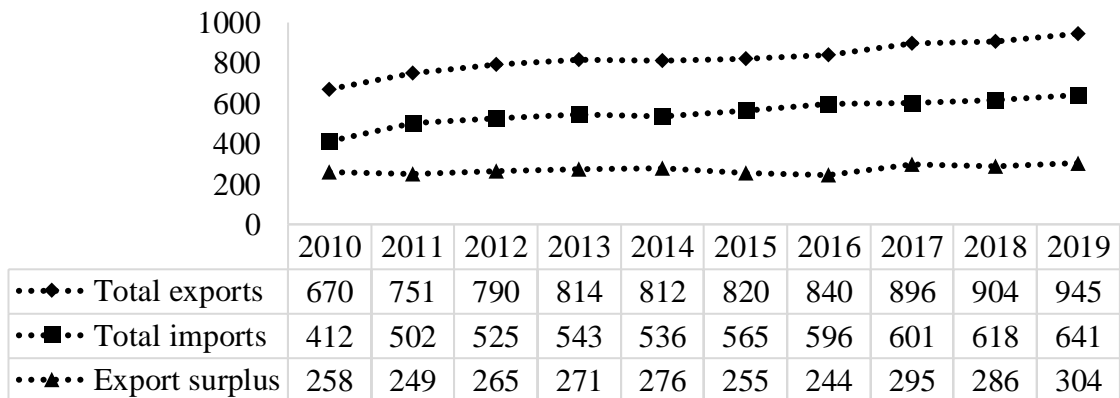


Figure 1.6 - Total import and export trade value of agricultural products.

(Unit: Billion euros)

Data source: http://www.360doc.com/content/22/0121/11/37581541_1014276441.shtml. [122]

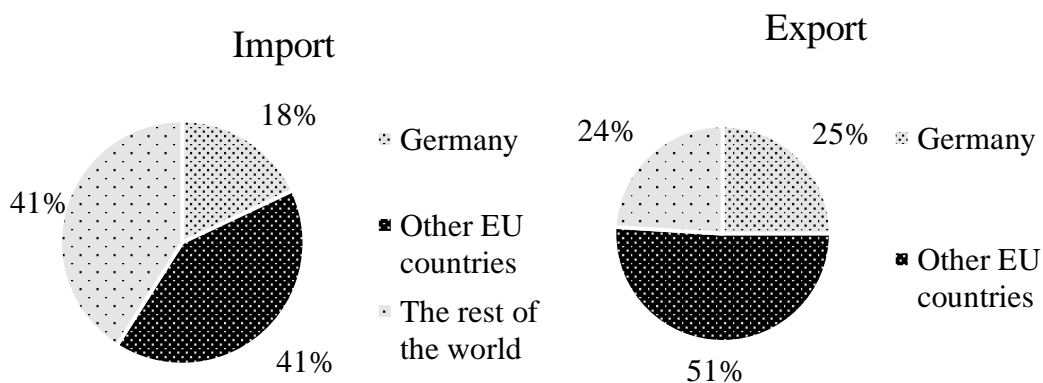


Figure 1.7 - Regional characteristics of Dutch agricultural trade partners

Data source: http://www.360doc.com/content/22/0121/11/37581541_1014276441.shtml. [122].

Agricultural products are highly specialized and scientific. More than 90% of the family farms in the Netherlands are specialized family farms. The specialization of production can make the agricultural division of labor more refined, improve the

professional efficiency and professional technology level, improve the level of agricultural mechanization, reduce the cost of agricultural production, and strengthen the competitiveness of agricultural products [123]. The business scale is expanded according to demand. Successfully explored a development path of family farms with moderate scale, high-tech content, large-scale mechanized operation and harmonious development with the environment. Cooperatives are closely linked to family farms. The family farm is not fighting alone, but developing in groups to form a cooperative. The family farm is the foundation, and the cooperative is the core and leading. Between them is a community of interests to maximize the economic interests of the family farm [124].

British family farm development experience. Britain has a total area of 244200 square kilometers and a total population of 64.1 million. Up to now, family farms have become an important organizational form of British agricultural development. Actively cultivate new professional farmers and professional brokers [125]. These economists analyze the supply and demand of agricultural products in the market through information sharing, timely grasp market information and respond. They impart their professional knowledge and production experience to farmers so that they can respond in time to changes in the market.

Due to the limitations of terrain and natural factors, family farms in Japan are mainly operated on a small scale. Japan is a country with more people and less land, with a land area of 378000 square kilometers, a population of 128 million, and per capita cultivated land of only 0.04 hectares [126].

The agricultural socialized service system is sound, and Agricultural Association organizations are popular. Due to the small scale of Japanese family farms and the scattered land, it is difficult to form a large-scale operation [127]. With the support of the government, the family farm association was established. The Agricultural Association group is a social welfare organization, Agricultural services run through all aspects of breeding, sowing, fertilization and weeding. Once farmers have a series of problems, they can seek help from the Agricultural Association group. In addition, the agronomy group will also come forward to regulate agricultural disputes, strengthen financing, and help

farmers with financial loans, agricultural insurance, infrastructure construction and other services [128].

Japan has also made full use of modern science and technology to improve the mechanization of agricultural production. Take tractors as an example. In terms of the same cultivated area, the number of large machinery in Japan is only equivalent to 30% of Germany, 76% of France and 86% of Britain, while the number of small tractors is 45 times that of Germany, 35 times that of France and 80 times that of Britain [65]. The development of small-scale mechanization in Japanese farms has made efficient use of land. Now, with the popularization of high automation, Japan's agricultural production has realized the whole process using machinery scale. Pay attention to brand effect [129]. Japan has established three levels of financial security from the central government to the local government [130]. The lowest level is the grass-roots credit cooperation organization. The middle-level Credit Union, and the highest level is the central treasury of agriculture and forestry under the leadership of the central government [131].

Ukraine is endowed with agricultural resources. In the reform of agricultural land marketization, the new government broke through many obstacles and lifted the ban on agricultural land marketization that had been banned for more than 20 years. From July 1, 2021, Ukraine will officially cancel the ban on the sale of agricultural land and implement the market-oriented reform of agricultural land. The important symbol of agricultural land marketization is that farmers can use their land as asset collateral and obtain loans from banks. To solve the problem of fund shortage of family farms. On the other hand, it will help revitalize the land and promote agricultural production. In terms of financing loans, the government has reached agreements with a number of banks to increase support for small and medium-sized family farms, provide preferential loans for small and medium-sized family farms, and solve the shortage of production funds for small and medium-sized family farms. In terms of specific operating procedures, the government approved the project, and the small and medium-sized enterprises that obtained preferential loans submitted loan applications family farm situation (Table. 1.3).

Table 1.3 - Ukraine Personal peasant households as of January 1, 2022

	January 1, 2022	Reference: January 1, 2021
Number of households, thsd.	3,921.5	3,954.8
The land area, thsd.ha	6,120.0	6,125.7
Including the intended purpose		
For construction and maintenance of residential house, commercial buildings and structures	777.1	787.0
For personal peasant farming	2544.2	2517.7
For agricultural commodity production	2,735.3	2,772.6
Total of which is rented	367.1	350.9
Number of households, thsd.	3,921.5	3,954.8

Data source: Query website, <https://ukrstat.gov.ua/>[132]

Note: Data exclude the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol and a part of temporarily occupied territories in the Donetsk and Luhansk regions. Personal peasant household is a household whose members, according to the current legislation, have a land plot with the intended purpose "for personal peasant farming".

According to the above description, although they are all family farms, the development and management of family farms are not the same. The actual situation of each country is different. The summary is as follows. (Table 1.4)

Table 1.4 - Characteristics of management of family farm development in different countries

Country	Advantageous Projects	Specific Performance
1	2	3
American	Smooth land circulation	1. Improvement of laws and regulations 2. Give full play to the role of the market. 3. Farmers' supply
	High scientific and technological level	1. There are many machines. 2. High technology is widely used, 3. Large scale production
	Specialization of production and operation	1. Regional professional production. 2. Precise delivery of varieties and fertilizers. 3. Various ways of increasing production
	Sound social services	1. Agricultural Risk Prevention and control Institutions 2. Sales organization. 3. Service organization.
	Financing insurance tradition	1. The authority guarantees the loan from the bank. 2. Social mutual aid and cooperative credit system.

Continuation of table 1.4

1	2	3
France	Large scale has been formed	1. The number of family farms decreased. 2. The scale of family farms has expanded and stabilized.
	Sound social services	1. Establish training institutions. 2. Close contact with agricultural cooperatives.
	Financing insurance tradition	1. Government subsidies or free subsidies. 2. The bank has low interest or no interest. 3. Spontaneous mutual aid Treasury. 4. Sound insurance system
	Smooth land circulation	1. Subsidy to purchaser 2. Establish a land trading company. 3. Supply to sellers
Netherlands	Production specialization	1. Refine agricultural production. 2. High technical efficiency and professional technical level.
	Sound social services	Close contact with cooperatives. Form "Cooperative integrated industrial chain organization mode"
	Scale up as needed	Form a family farm development path with appropriate scale, high scientific and technological content, mechanized operation.
British	Sound social services	1. Cultivate new farmers. Improve the level of farmers. 2. Cultivate professional brokers to help farmers from production to sales.
	High degree of specialization	Many farms only focus on one aspect, which is both professional and efficient. Specialized farms are generally developed.
	Farm scale expansion	Through the "enclosure movement", the land of rich farmers was expanded.
Japan	High level of mechanization	1. Mainly small and medium-sized agricultural machinery. 2. Mechanization of the whole agricultural production process.
	Sound social services	Establish "agricultural associations" to help in the whole process of agricultural production.
	Financing insurance tradition	1. Government subsidies or free subsidies. 2. The bank has low interest or no interest. 3. Spontaneous mutual aid Treasury. 4. Sound insurance system
	Smooth land circulation	1. Subsidy to purchaser 2. Establish a land trading company. 3. Supply to sellers
	Efficient land use	1. Land planning, transformation and reclamation. 2. Use chemical fertilizers to improve the quality of land. 3. Using biotechnology to improve crop productivity

Data source: Literature collation and research induction

According to the scientific experience in the development and management of excellent domestic family farms, Chinese family farms started late. Still, they developed rapidly with the strong support of central policies and local governments. At present, a family farm model with its own characteristics has been formed in some regions of the country. The development model of family farms in Songjiang area of Shanghai under

the guidance of the government, the development model of family farms in Ningbo, Zhejiang under the guidance of the market, and the development model of family farms in Langxi, Anhui under the guidance of the market.

Shanghai Songjiang mode led by the government. Songjiang District, located in the southwest of Shanghai, has 11 towns, 4 streets. It is a famous land of plenty in the south of the Yangtze River. The exploration of Songjiang family farm began in the second half of 2007. After five years of development, by the end of 2012, there were 1206 family farms, with a business area of 9111 hectares and an average household business area of 7.5 hectares, covering 80% of the grain fields in the region. The net income per person of a family farm operator is about twice that of a local migrant worker. The average net income per household is 106100 yuan. By 2020, the average household income of 838 family farms has increased from 46000 yuan in 2007 to 155000 yuan, the net income per hectare has increased from 6900 yuan to 14670 yuan, and the land circulation rate is as high as 99.9%. Ten thousand hectares of rice, accounting for 68% of the cultivated area, have been mechanized throughout the process [133]. Shanghai Songjiang family farm model has taken the lead in the country.

The main practice of Songjiang family farm is: under the guidance of the government, the village committee, as an intermediary, first transfers the cultivated land into the hands of farmers to the village committee, and then the district government renovates the cultivated land transferred to the village collective into high-standard basic farmland, and then contracts the cultivated land to the new lessee according to the relevant conditions [134]. The rapid development of Songjiang family farm is inseparable from the guidance of the local government. It can be said that Songjiang model is a family farm model led by the government. Government-led, policy supporting and financial support. In order to accelerate the transformation of agricultural development mode, Shanghai Songjiang began to explore the operation of family farms in the second half of 2007.

It ensures the smooth circulation of land. In the process of the development of family farms, Songjiang District fully respects the interests of farmers who contract land [135]. In order to protect the interests of the farmers who transferred the land, Songjiang District does a good job in issuing the land contract management certificate, respects the

interests of the farmers who transferred the land, guarantees the pension of the farmers who transferred the land, and greatly promotes the transfer of land. In 2010, the total land transfer area of Songjiang District was 16,633 hectares, accounting for 98.4 percent of the total cultivated land. By the end of 2020, the total land transfer area will reach 16,867 hectares, accounting for 99.9 percent of the region's total land area (table 1.5).

Table 1.5 - Land circulation in Songjiang District in 2020

Songjiang towns	Cultivated land area	Land circulation area	proportion
Chedun town	22290	22290	100%
Xinqiao Town	5668	5668	100%
Dongjing Town	6911	6911	100%
Sijing town	5466	5466	100%
Jiuting town	4492	4492	100%
Sheshan town	25565	25565	100%
Yexie town	50622	50622	100%
Shihudang town	25756	25502	99.0%
Maogang town	29790	29790	100%
Xinbang town	36540	36540	100%
Xiaokunshan town	16183	16183	100%
Yongfeng Street	8765	8765	100%
Zhongshan Street	3535	3535	100%
Fangsong Street	4058	4058	100%
industrial area	7840	7840	100%
Total	253481	253227	99.9%

Data source: Literature collation and research induction

The supporting facilities of social services are perfect. To ensure the normal operation of family farms, under the guidance of Songjiang District government, Songjiang has provided relatively perfect supporting services in agricultural machinery, farmer training, agricultural means of production and so on. It has a strict management system, which has clear and specific requirements for the operation qualification of family farms, family farm operators, family farm assessment, family farm withdrawal and family farm renewal conditions, and is strictly implemented in the operation of family farms [136].

Ningbo is located in the east of Zhejiang Province, with six districts, three county-level cities and two counties. The total number of family farms in Ningbo reached 16785 by the end of 2020, with an annual sales value of 2.752 billion yuan. The economic benefit is much higher than that of ordinary farmers [137]. Ningbo family farm is market-oriented and constantly developing. In the definition of family farms by the Agricultural Department of Ningbo, it is required that they must be agricultural business entities that have been registered with the industry and commerce; Bookkeeping and financial statements are required and responsible for their own profits and losses.

Under the guidance of the market, Ningbo family farms actively participate in agricultural industrialization production, establish close ties with agricultural production organizations such as agricultural enterprises and farmers' professional cooperatives, and form a new mode of agricultural industrialization management such as "family farms + agricultural cooperatives", "family farms + agricultural enterprises". Agricultural enterprises in Ningbo are relatively developed, with more than 280 processing agricultural enterprises in Cixi alone [138]. In 2020, 163 family farms signed product purchase and sales contracts with agricultural enterprises, digesting a large part of agricultural products. Ningbo's land circulation fees are also market-oriented and adjusted accordingly with market changes. Under the guidance of the market, Ningbo family farm attaches great importance to brand building and emphasizes carrying out production according to standardized standards and technical requirements. There are more farmers receiving higher education in Ningbo. They are willing to learn new knowledge and have high professional quality. Financing is relatively convenient. Financial institutions at all levels in Ningbo City, Zhejiang Province provide loan support to family farms and continue to innovate in loan guarantees.

Anhui Langxi family farm development mode is market-oriented, government support. Under the guidance of the market, give full play to the dominant position of farmers. In industrialization and urbanization, the conditions for land circulation are mature, and the development of family farms has become an independent and voluntary choice of farmers. The government took advantage of the situation and actively supported it. In the development of Langxi family farm, the local government departments did not

intervene too much, but determined the direction of agricultural development and took advantage of the trend and actively supported it.

The family farm association provides help. The Langxi Local Family Farm Association supports the development of family farms in Langxi. In 2009, Langxi local established the first family farm Association [139]. To provide policy information consultation, agricultural technology guidance, financing and other related services for local family farms, guide the standardized development of local family farms, and become a link between family farms and the government. After the establishment of the family farm Association, dozens of agricultural technical cadres have been organized to carry out one-on-one assistance activities with family farms, and farmers have received special training through holding multi-level and multi-type training courses, so as to improve the application level of agricultural informatization of farmers [140]. Langxi Family Farm Association has also played a great role in solving the problem of financing difficulties of family farms. The family farm association actively coordinated with many local banks to connect with family farms and launched special loan products for family farms. Through the development of family farms, the income of farm operators has been greatly increased, and family farms have also led to the promotion of agricultural technology and the improvement of the structure of agricultural products through demonstration and guidance, which has greatly promoted the development of modern agriculture.

According to the above analysis, the characteristics of the development and management of outstanding family farms in China are summarized as follows. (Table 1.6)

Table 1.6 - Characteristics of Management of the Development of Excellent Family Farms in China

City	Advantageous Projects	Specific Performance
1	2	3
Songjiang District, Shanghai City	Strict management	There are clear requirements for farm operation qualification, farm operator, family farm assessment, family farm withdrawal and family farm renewal conditions, which are strictly implemented in family farm operation.
	Sound social services	1. Land is exchanged for security, and landless farmers are included in the insurance system.

Continuation of table 1.6

1	2	3
		2. Land lost farmers enjoy subsidies. 3. Train new farmers. 4. Provide machinery and means of production services. 5. Hire scientific and technological personnel to help the family farm.
	Smooth land circulation	1. Unified government lease. 2. Establish high standard farmland. 3. Sublet to farmers.
	Government led	1. Improve the policy. 2. Financial support
Ningbo, Zhejiang Province	Focus on brand building.	1. Set an "example effect". 2. Implement standardized production and management. 3. Note the promotion and application of new technologies, new varieties and new facilities.
	Sound social services	1. Attract and cultivate high-end talents and give subsidies. 2. Establish new farmer training courses 3. There are many financial institutions, many ways and convenient financing. 4. Sound policy insurance. 5. Provide farmers with important information of production and sales.
	Smooth land circulation	Guided by the market price, the land circulation rate is about 72%, and the land circulation has also broken through the original village boundaries. At the same time, subsidies will be given to the transferor and the transferee.
	Establish contacts and share benefits.	A new mode of agricultural industrialization has been formed, such as "family farms + agricultural cooperatives", "family farms + agricultural enterprises".
	Market leading	Industrial and commercial registration aims at maximizing profits, operates independently, assumes sole responsibility for profits and losses, and has a high degree of entrepreneurial operation
	High quality of operators	1. Many farmers receive higher education. 2. There are many farmers engaged in agricultural business 3. Many farmers have been engaged in agriculture.
Langxi, Anhui Province	Help from the family farm Association	Provide policy information consultation, agricultural technology guidance, financing and other related services for local family farms
	Sound social services	The government took advantage of the situation and actively supported it. The government has built a platform to respect the initiative of farmers and always let farmers be the "protagonists"
	Establish contacts and share benefits.	Form a variety of family farm development models such as "market + farm", "farm + farm", "farm + enterprise".
	Market leading	Under the guidance of the market, give full play to the dominant position of farmers.

Data source: Literature collation and research induction

The analysis results show that the development and management characteristics of excellent family farms in these three regions are: high comprehensive quality of farmers, government or market leadership, perfect social services, relatively smooth land circulation, and family farmers paying attention to market and brand building. With the help of the Family Farm Association, we will carry out strict management and provide all-around help and guidance in the development and management process from pre-production, during production to post-production.

Scholars have also made a lot of analysis on the economic and organizational aspects of land use in China. The acceleration of rural land circulation has promoted the development of agricultural scale management in China. The price of agricultural land circulation is a key factor affecting the development of China's agricultural land market. It is related to major issues such as the efficiency of agricultural land circulation and the protection of farmers' rights and interests, which have attracted widespread attention in academia.

First of all, the price of agricultural land circulation should be formed under the market mechanism [141]. Liu K and Chi Z believe that the rental price reflects the supply and demand of agricultural land to some extent [142]. Land rent is a good indicator of farmland value [143]. Deng D believes that the circulation of agricultural land is the circulation of rights, and the circulation of rights is actually the circulation of land income [144]. The part exceeding the income and profit of land operators may be converted into land rent. As early as the early 20th century, Chinese farmers used quota payment and sharing payment in land leasing, which were also the best institutional choices under the information symmetry and asymmetric structure in the transaction process [145].

The existing research believes that the domestic agricultural land circulation price is high. According to the data of fixed observation points in rural areas in 2015, farmers who transfer out their land and charge rent charge an average rent of 25.7% of the land output value [146]. Because there were proposals to develop appropriate agricultural operations, the rent of agricultural land circulation has increased very fast, which has brought greater cost pressure to the expansion of agricultural operation scale [147]. From 2005 to 2016, the cost of land circulation increased by 13% annually in nominal terms.

The basic fact that rural land has been over capitalized in some parts of China is the direct evidence that the land rent has risen too fast in recent years, and its actual level has greatly exceeded the reasonable level that grain production can afford, It even exceeds the reasonable level that the production of cash crops can bear [148]. The rising price of land circulation has become an important factor affecting the large-scale operation of agriculture, especially grain production [149]. If it is allowed to rise, it will certainly affect grain production, and scale management cannot develop, making it more difficult to improve the international competitiveness of China's agricultural products [150].

The existing literature studies the influencing factors of domestic land circulation. First, the theoretical research mainly includes. Administrative intervention is one of the reasons for the formation of high rent. Large scale land circulation led by the government, Generally, higher rent needs to be paid [151]. The unified land transfer of grass-roots governments is also prone to raise rent, which can not truly reflect the price information in the land transfer market, resulting in price distortion [152]. In the case of government-led land transfer, it is usually difficult for contractors to obtain agricultural land with reduced price. The more common practice is to maintain the previous price, or even slightly increase it, and rarely reduce it according to the market [153]. Industrial and commercial capital to the countryside raised the rent of land circulation. Although on the whole, the rent rise is mainly market behavior, the entry of industrial and commercial capital is also a factor that cannot be ignored. Other factors such as the scarcity of cultivated land, property rights reform, land lease term, rent settlement method, and the stability of non-agricultural income sources of land transfer out households will affect the land circulation price [154]. In addition, the "non-agricultural", "non-grain" demand and investment demand of rural land are the endogenous driving forces of rent rise [155]. Agricultural land transfer price is not only constrained by the characteristics of farmers and agricultural land, but also affected by the characteristics of local economic environment and policy environment, and agricultural land transfer price has a certain degree of conductivity between regions [156]. Second, empirical research is also very rich. Wu Zhenjun based on the analysis of farmers' data in Anhui and Zhejiang provinces, showed that the education level, land management content The agreed period of transfer

and the degree of farmers' organization have a significant impact on the transfer price of agricultural land [157]. Jiang Shubin and Su Qun used the data of farmers in Jiangsu Province to study how the structural adjustment of the planting industry and labor transfer affect the rent of agricultural land transfer in the opposite direction [158].

Land circulation has an impact on the development of family farms that cannot be ignored. In terms of the impact on the willingness of family farms to expand their operations, the cost of land circulation, the source of land circulation and the degree of standardization of land circulation have a negative relationship with the willingness of family farms to expand their operations. In contrast the duration of land circulation Factors such as the identity of land circulation and the post-consolidation of land circulation have a significant positive impact on the willingness of family farms to expand their operations [159]. In the study of the impact on the operating performance of family farms, land transfer can expand the operation scale of family farms, effectively improve the scale efficiency of family farms, and the increase in the number of years of land transfer can also significantly improve the operating efficiency of family farms [160]. The unstable land ownership relationship and the fragmentation of operating land will have a significant negative impact on the operating efficiency and operating performance of family farms [161]. China is also carrying out land transfer policies. However, contracts in the process of land transfer are often oral agreements, and the content of paper contracts is not detailed enough, which is easy to cause disputes. Moreover, the information is unequal and cannot be circulated in time. Farmers who want to transfer land cannot find contractors, and enterprises who wish to rent land cannot find farmers who want to share land [162].

On the basis of land transfer theory and land property right theory, the scholars combined with the willing degree and pattern of farmer land transfer, carried out a systematic and comprehensive study, and found the outstanding problems, providing the necessary theoretical and practical basis for the smooth transfer of rural land in our country. In combination with the problems and causes of land circulation in China, it is of great theoretical and practical significance to conduct research on the general laws of family farmland circulation, research on land circulation models and analysis on the paths

and countermeasures to realize land circulation, which will help promote the development and expansion of family farms in China in terms of scale, specialization, standardization and branding.

1.3 Modern approaches to assessing the development of family farms

Since the reform and opening up, the traditional agricultural production and management model has seriously restricted the development of agriculture. Therefore, advocating a new type of agricultural management entity and developing an appropriate scale of management is of great significance to the development of agriculture. As an important part of the new type of management entity, the level of development of family farms directly affects the overall agricultural development. Family farms are an important part of realizing rural revitalization and promoting agricultural economic development [163].

In the process of rapid development of modern agriculture, innovating the agricultural management mechanism and cultivating family farms will promote the improvement of agricultural production efficiency and economic benefits in China [164]. At the same time, which play an important role in promoting large-scale and intensive agricultural management in China [165]. The emergence of family farms has changed the traditional production and operation mode and provided an alternative guiding direction for China's agricultural development. It has become one of the new agricultural management entities [166]. Because it has the advantage of abundant labor resources, but at present, family farms are still in the initial stage of development. However, in terms of the current overall development level, the development level of family farms is extremely unbalanced (Figure 1.8).

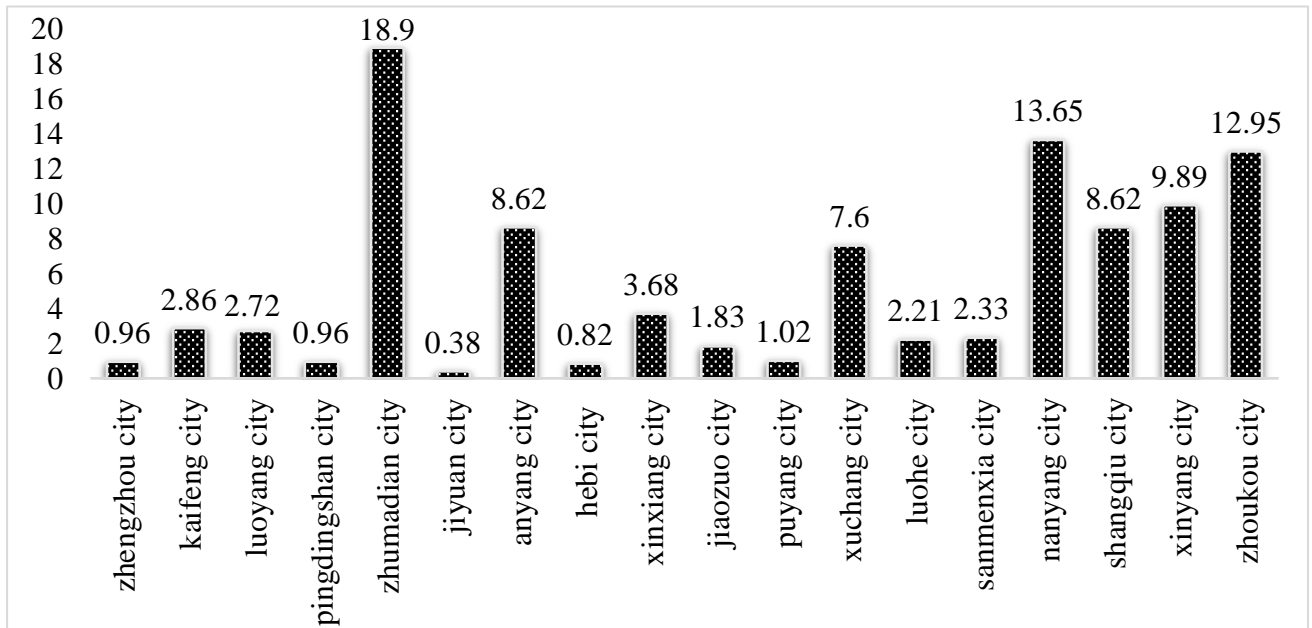


Figure 1.8 - The proportion of family farms

Data Sources: <https://usdasearch.usda.gov/search?affiliate=usda&query=farm>. [167]

The industrial layout of family farms is too concentrated on grain cultivation, with relatively few other industries. There are more planting industries, and the proportion of grain planting in the planting industry is relatively large, and the animal husbandry industry is small. There are very few industries that combine breeding. The industry distribution of family farms is still dominated by planting, accounting for 88.8%, combined with planting and breeding accounted for 4.5%. Animal husbandry accounted for 4.3%, fishery accounted for 0.5%, and the rest accounted for 1.9% (Figure 1.9).

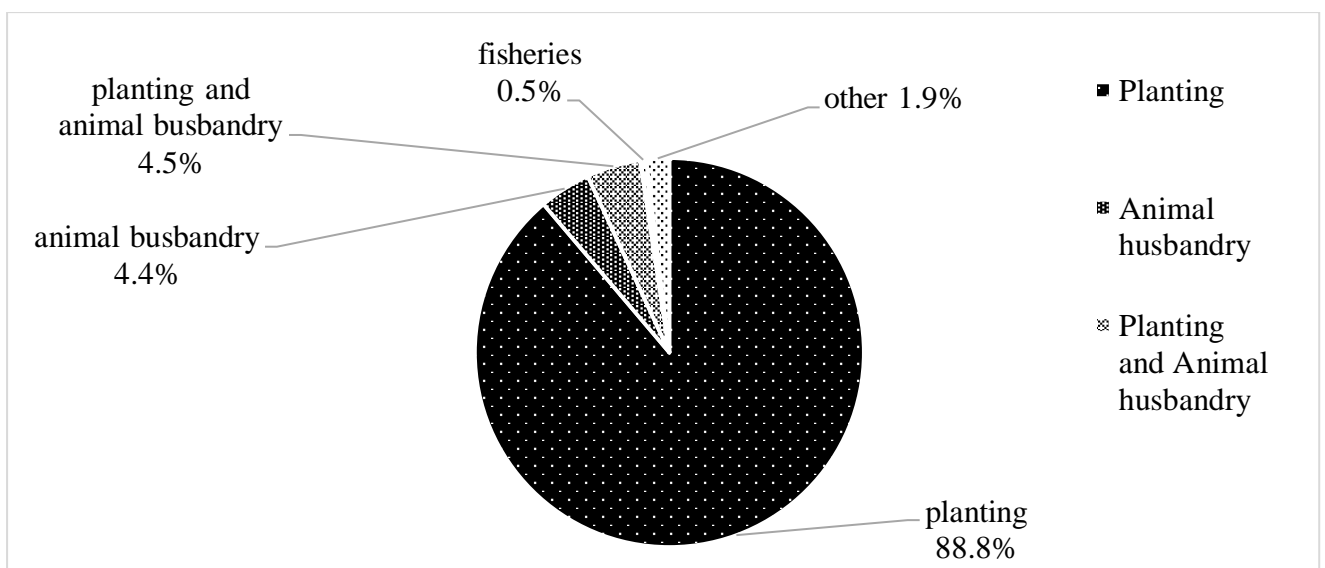


Figure 1.9 - Industry distribution of family farms

Data Sources: <https://usdasearch.usda.gov/search?affiliate=usda&query=farm>. [167]

However, due to the short development time and insufficient experience of family farms in China, as well as the weak status of the agricultural industry, family farms are also facing problems such as extensive management, poor land circulation and difficult financing, which seriously restrict the healthy development of family farms [168]. Therefore, it is of great significance to pay attention to the development of family farms and explore and solve the practical problems of family farms. Family farms have generally performed well in recent years, but some have lost money, according to the Department of Agriculture. The proportion of loss-making family farms is even as high as about 15%. If the state subsidies are not considered, the proportion of loss-making farmers will exceed 20%. This data seriously shows that there are great risks in the production and operation of family farms. At present, the operational risks of family farms include the following aspects:

Family farms are at risk of being over-scaled. Through the continuous promotion and practice of family farms, China's current family farms are showing a trend of expanding year by year, and the land area is increasing, but there are great risks in this state. As an agricultural model of moderate management, family farms are not suitable for excessive large-scale development, but the current development of family farms has exceeded market demand, and excessive large-scale production is bound to cause production risks, The economic efficiency of family farms will be gradually reduced, and there will also be excessive employment development, resulting in excessive reliance on hired labor in agricultural production [169]. This phenomenon seriously violates the basic principles of family farms, resulting in the phenomenon of greatly reduced production efficiency, which is not conducive to the sustainable development of family farms.

Family farms are at risk of labor shortages. At present, with the continuous improvement of people's living standards, many young people rush from rural areas to cities, and the agricultural labor force is seriously scarce [170]. The successful experience of family farms shows that the development of family farms requires a stable and high-quality labor force. At the same time, because agriculture requires different jobs in different seasons, labor employment has a certain seasonality. However, because the working hours of family farms overlap with those of ordinary small farmers, it is difficult

to hire experienced. High-quality labor, and the young and middle-aged people left behind are limited, resulting in the price of agricultural hired labor rising year by year, there is a greater labor risk, affecting the stable development of family farms, but also increasing the employment cost of family farms, which is not conducive to the production efficiency of family farms [171].

Family farms are at risk of high production costs. With the gradual increase of family farms, the price of many land resources is also gradually rising, resulting in the cost of family farms in land leasing also gradually rising. In the operation of family farms, the cost of land resources accounts for more than half of the total operating cost. If the rental cost of land resources is too high, there will be greater risks in the production cost of family farms. At present, due to the relatively dispersed rural land resources, the average person owns little arable land, family farmers must lease land to many farmers in order to form a large area of land, which also increases the land lease, the formation of scale difficulties, often need to increase rent to go out, a more rental cost. At the same time, due to the relatively short land leasing contract, The land circulation is also relatively fast, which brings huge risks to the production cost of family farms and is not conducive to the long-term operation of family farms.

There is a risk of simplification in the management structure of family farms. In the management of family farms, family farms are different from small farmers [172]. They need to be guided by market demand and profits, and gradually tend to develop in a single structure. Driven by interests and the temptation of commercialization, many family farms no longer plant traditional crops in the area, but choose to plant crops with large market demand and sufficient profit space, which leads to a single planting structure, increased competition, and the gradual loss of the position of traditional crops in the agricultural market, with great operational risks.

The basic equipment of family farms is backward. Because the family farm has a certain scale and the output of grain is also very huge, a complete set of infrastructure and sites are needed to ensure the quality of grain when drying and storing grain. At the same time, a large number of mechanical equipment are required during the planting period of farmland. According to the current situation, many family farms do not have the ability

to buy large machinery and equipment, so they often need loans. However, when making loans, relevant loan policies are not open enough, farmers have few loan channels and low loan limit, which leads to the failure to update the infrastructure of family farms and restricts the development of family farms [173]. At the same time, many family farms have relatively weak business awareness in land circulation intermediary services and grain sales. They lack professional management knowledge, resulting in greater risks in related services.

Family farms have limited bargaining power in the market. At present, from the perspective of family farm management, grain sales still adopt the traditional small farmers' sales mode. The sales channel is mainly direct sales to grain collection points, and the grain purchase price is still at the same level as that of ordinary farmers [174].

The U.S government has integrated a three-level agricultural information network with government information services as the main body, forming a complete, sound and standardized agricultural information service system [175]. The system consists of five pillars: government-led, market demand, legal guarantee, operation mode and service team [176]. Agricultural system simulation, agricultural production and management, agricultural expert system The agricultural expert support system provides a software basis for obtaining agricultural information and timely processing. At the same time, we will build a strong agricultural network and a rich agricultural data resource platform to share resources [178]. Second, new information technologies that are widely used, such as the Internet of Things and cloud computing, have been widely used in agriculture, promoting the development of agricultural production and operation towards automation, accuracy, intensification, standardization and intelligence [179]. Medium-scale farms and almost all large farms in the United States use GPS tractors, harvesters, and seeders to implement automatic operations, and also benefit from agricultural expert systems, intelligent agricultural machinery systems, environmental monitoring systems, system integration, networked management systems, and training system information technology to carry out refined adaptive water spraying, fertilization, and drug spraying for crops, effectively improving the informatization level of family farms [180]. More than 90% of German family farms use computer and network technology, and agricultural information

technology is widely used [181]. It is necessary to establish a diversified, multi-channel and multi-agent information service system.

Research on Internet marketing of agricultural products. Henderson pointed out that the disadvantages of the Internet are also obvious. To encourage farmers sell agricultural products on the Internet, it is necessary to solve the problems such as the ability of the Internet to meet the needs of farmers, privacy and security [182]. Wen. W proposed and discussed various functions of e-commerce applied to agriculture, information sources, recording data, making models, purchasing products, selling products, etc., and analyzed the intelligent e-commerce system, which includes agricultural product sales, financial analysis and sales forecast, and can infer the feasibility and action plan of the scheme based on Rules [183]. Mesa J.C proposes that Internet marketing of agricultural products has a positive effect on the brand building and promotion of agricultural products, and enables enterprises to obtain benefits, thus accelerating the improvement of agricultural product sales [184]. Xiang Chaoyang believes that in the face of the rapid development of the Internet, the state's protection of agricultural products has been reduced, and the competition faced by agricultural enterprises has become greater. Put forward the marketing strategy based on the function positioning of agricultural product network marketing [185]. Yu Juan and Li Ping analyzed the problems in the marketing of agricultural products in China under the environment of rapid development of e-commerce. They proposed that the government and agricultural product-related organizations should further strengthen the construction of rural network projects and strengthen the training of agricultural product network marketing personnel [186]. Yu Xiaohua believes that the network marketing mode is the most effective way to solve the contradiction between supply and sales of agricultural products. Network marketing can effectively avoid the risks caused by the asymmetry of supply and demand information in the product trading process. Therefore, he proposes an innovative strategy for improving the network marketing mode and information service system of agricultural products [187].

Research on the architecture of Internet marketing systems for agricultural products. The effect of agricultural product network marketing depends on the configuration of the

whole system, so we need to do overall planning and optimize the whole process [188]. On the basis of analyzing the strategic position and importance of agricultural product network marketing under the current environment, Dong Hongan made a preliminary discussion on the system framework of agricultural product network marketing from four aspects: support system, application system, guarantee system and supporting measures [189]. Wang Shuofei expounded on the shortcomings of China's agricultural product network marketing from the aspects of rural infrastructure, logistics, network marketing talents, agricultural product standardization and information network, and accordingly proposed the construction strategy of China's agricultural product network marketing system based on information sharing system, market system, logistics distribution system, guarantee system and support system [190]. Family farm's own survival and development needs family farm agricultural products brand construction. It can establish brand loyalty, brand strength and brand equity in the target market, which is conducive to improving competitiveness and expanding the international market. It is conducive to the online sales of family farm agricultural products.

To better study the modern methods of the development of management of family farms, the author investigated 191 family farms through field visits and network research in 2020. A total of 198 questionnaires were distributed and 178 questionnaires were recovered, with a recovery rate of 93.2%, of which 170 were valid, with an effective rate of 95.5% (Appendix B).

The research method is as follows: Logistic model is constructed, variables are introduced into the model for evaluation, SPSS23.0 measurement software is used to evaluate the model, and the regression results are obtained. The influence coefficient of scientific development factors of family farms is obtained. Through logistic regression analysis, the weight of variables can be obtained, to know which factors affect the development of family farms and lay a foundation for making suggestions.

This research analyzes the development and operation of family farms, and studies the specific factors affecting the development of family farms. The total annual profit of family farm is taken as the index to measure the efficiency of family farm. Among the influencing factors, this paper will study the situation of farmers, basic operating

conditions, land circulation, sales channels, financing and brand. Among them, the situation of farmers mainly includes age, education level and whether they have received agricultural training. Basic operating conditions mainly include business scope and farmland scale. The selection and definition of variables are shown in the following table 1.7.

Table 1.7 - Variable selection and definition

Variable Types	The Variable Name	Variable Definitions
Farm Benefit	Farm Profitability	Less Than 100000 = 1; 10 ~ 200000 = 2; 20 ~ 300000 = 3; Over 300,000 =4
Farmer's Situation	Age	Under 30 =1; 30 -40 Years Old = 2; 40 ~ 50 = 3; Over 50 =4
	The Degree Of Education	Junior High School And Below =1; High School = 2; Subject = 3; Bachelor Degree Or Above =4
	Have You Received Any Training In Agriculture	n = 0; Is = 1
Basic Operating Conditions	Scope Of Business	Planting =1; Aquaculture =2; Fisheries = 3; Leisure Tourism =4; Other = 5
	Farm Land Size (Unit: Hectare)	Less Than 6.67 = 1; 6.67 ~ 20 = 2; 20 ~ 40 = 3; More Than 40 = 4
Sales Way	Online Sales	More Than 200 = 5
Financing Situation	Whether Financing Meets Demand	n = 0; Is = 1
Brand	Is There a Brand?	n = 0; Is = 1
Land Circulation	Land Area Of Circulation (Unit: Hectare)	Less Than 2 = 1; 2 ~ 4 = 2; 4 ~ 7.3 = 3; 7.3 ~ 13.3 = 4; More Than 13.3 = 5

Data source: Data survey and summary

In this research, multivariate ordered Logistic regression model is finally adopted for analysis, and the expression of the model is as follows:

$$Y = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_6 + \beta_7x_7 + \beta_8x_8 + \beta_9x_9 + \varepsilon$$

Table 1.8 - Proportion of collected data

Project		The Case Number	Marginal Percentage
1	2	3	4
Farm Profitability	Less Than 100000	32	18.8%
	10 ~ 200000	48	28.2%
	20 ~ 300000	51	30.1%
	More Than 300000	39	22.9%

Continuation of table 1.8

1	2	3	4
Age	Under The Age Of 30	24	14.1%
	30 ~ 40 Years Old	47	27.6%
	40 ~ 50 Years Old	48	28.2%
	50 Years Of Age Or Older	51	30.1%
The Degree Of Education	Junior High And Below	67	39.4%
	High School	54	31.8%
	Specialized Subject	29	17.1%
	Bachelor Degree Or Above	20	11.7%
Have You Received Any Training In Agriculture	No	90	52.9%
	Yes	80	47.1%
Scope Of Business	Farming	49	28.8%
	The Breeding	25	14.7%
	Fisheries	36	21.2%
	Leisure Sightseeing Tour	42	24.7%
	Other	18	10.6%
Farm Land Size	Less Than 6.67 Hectares	56	32.9%
	6.67 ~ 20 Hectares	58	34.1%
	20 ~ 40 Hectares	23	13.5%
	Over 40 Hectares	33	19.5%
Online Sales	No	72	42.4%
	Yes	98	57.6%
Whether Financing Meets Demand	No	80	47.1%
	Yes	90	52.9%
Is There a Brand?	No	98	57.6%
	Yes	72	42.4%
Land Circulation	Less Than 2 Hectares	13	7.6%
	2 ~ 4 Hectares	15	8.8%
	4 ~ 7.3 Hectares	52	30.6%
	7.3 ~ 13.3 Hectares	39	22.9%
	Over 13.3 Hectares	51	30.1%

Data source: Data survey and summary

Table 1.9 - Parallel line test

Model	Minus 2 Logarithmic Likelihood	Chi-Square	Degrees Of Freedom	Significant
The Null Hypothesis	333.498			
Conventional	276.877 ^b	56.622 ^c	42	.065

Data source: Data survey and summary

Before multivariate ordered Logistic regression, the parallel line test is the condition for multivariate ordered Logistic regression. Multivariate ordered Logistic

regression can be used only when the significance of the parallel line test is greater than 0.05. In the model in this dissertation, according to the results in Table 1.9, the Chi-square value is 56.622, corresponding significance is 0.065, indicating that the parallel line test is passed, that is, the coefficients of all regression models are consistent, and multiple ordered Logistic regression can be used.

Table 1.10 - Goodness of fit

	Chi-Square	Degrees Of Freedom	Significant
Pearson	492.163	480	.341
Deviation	333.498	480	1.000

Data source: Calculated by the author

According to Table 1.10 goodness of fit, Pearson chi-square value is 492.163, corresponding significance is $0.341 > 0.05$, indicating that the fitting of the model to the original data has passed the test and the model is statistically significant.

For empirical analysis. Use SPSS 23.0 software for multivariate ordered Logistic regression analysis of sample data, and the results are shown as follows:

Table 1.11 - Parameter Estimation

1	2	3	Standard Error	Wald	Degrees Of Freedom	Significant	95% Confidence Interval	
							Lower Limit	Upper Limit
							8	9
Threshold Value	[Farm Benefit= 1.0]	-5.551	.802	47.872	1	.000	-7.123	-3.978
	[Farm Efficiency = 2.0]	-3.431	.724	22.438	1	.000	-4.851	-2.011
	[Farm Efficiency = 3.0]	-1.041	.680	2.343	1	.126	-2.375	.292
Location	[Age = 1.0]	-.326	.436	.558	1	.455	-1.181	.529
	[Age = 2.0]	-.134	.433	.096	1	.757	-.983	.715
	[Age = 3.0]	.371	.524	.501	1	.479	-.656	1.398
	[Age = 4.0]	0a	.	.	0	.	.	.
	[Education =1.0]	-1.457	.455	10.243	1	.001	-2.349	-.565
	[Education =2.0]	-.950	.413	5.281	1	.022	-1.760	-.140
	[Education =3.0]	-.828	.491	2.846	1	.092	-1.790	.134
	[Education =4.0]	0a	.	.	0	.	.	.
	[Training In Agriculture =0]	-1.103	.337	10.731	1	.001	-1.764	-.443
[Training In Agriculture =1.0]	0a	.	.	0	.	.	.	

Continuation of table 1.11

1	2	3	4	5	6	7	8	9
	[Scope =1.0]	-.646	.708	.831	1	.362	-2.034	.742
	[Scope =2.0]	-1.075	.755	2.025	1	.155	-2.554	.405
	[Scope =3.0]	-.903	.547	2.723	1	.099	-1.976	.170
	[Scope =4.0]	-.365	.677	.290	1	.590	-1.692	.963
	[Scope =5.0]	0a	.	.	0	.	.	.
	[Farm Land Size =1.0]	-.136	.450	.092	1	.001	-1.019	.746
	[Farm Land Size =2.0]	.818	.468	3.058	1	.080	-.099	1.734
	[Farm Land Size =3.0]	-.002	.575	.000	1	.997	-1.129	1.125
	[Farm Land Size =4.0]	0a	.	.	0	.	.	.
	[Land Area Of Circulation =1.0]	-.257	.778	.110	1	.741	-1.781	1.267
	[Land Area Of Circulation =2.0]	.446	.849	.276	1	.599	-1.218	2.110
	[Converted Land Area =3.0]	2.479	.542	20.941	1	.000	1.417	3.541
	[Land Area Of Circulation =4.0]	-.457	.662	.477	1	.490	-1.755	.840
	[Land Area =5.0]	0a	.	.	0	.	.	.
	[Online Sales =.0]	-1.519	.357	18.143	1	.000	-2.218	-.820
	[Online Sales =1.0]	0a	.	.	0	.	.	.
	[Whether Financing Meets Its Own Needs =.0]	-1.338	.352	14.476	1	.000	-2.027	-.649
	[Whether Financing Meets Its Own Needs =1.0]	0a	.	.	0	.	.	.
	[Brand =.0]	-1.285	.375	11.708	1	.001	-2.020	-.549
	[Brand =1.0]	0a	.	.	0	.	.	.

Data source: Calculated by the author

According to the parameter estimates in Table 1.11, the following conclusions can be drawn: Among the factors influencing the economic benefits of family farms, the significance of education level, agricultural training, land area transfer, online sales, financing to meet the needs of the brand are all less than 0.05, indicating that these factors have a significant impact on the economic benefits of family farms; The significance of

age, business scope and farmland size was greater than 0.05, indicating that these factors had no significant effect.

In the case of farmers, education level and whether they have received agricultural training have a significant impact on the economic benefits of family farms. Among them, the significance of junior high school education or below was $0.001 < 0.05$, coefficient estimated value is $-1.457 < 0$, the significance of high school education was $0.022 < 0.05$, coefficient estimated value is $-0.095 < 0$, which suggests that comparative education degree for bachelor farmers, farmers farms under education degree for high school and poor economic benefit is obvious, it also suggests that the farmers suffer education degree is higher, the better the economic benefits of the farm, this is because the higher the degree of farmer, have more professional knowledge of the farm, willing to learn and understand the advanced agricultural technology, They are more efficient in resource utilization and more competent in farm management, so their farm economic returns are better than those of less educated farmers. In addition, no training in agriculture was significant at $0.001 < 0.05$, coefficient estimated value is $-1.103 < 0$, which indicates that compared with the agricultural trained farmers, no agricultural training farmers economic benefit from a farm, it also suggests that the farmers have been trained by agriculture, the economic benefits of the farm are better, this is because have been trained by professional agricultural farmers, in agricultural technology, agricultural production process, farm management, and other aspects have more abundant knowledge, That can guide them to better run family farms, so that their farms are more economically productive than those without agricultural training. In the basic business conditions, the results of business scope are not significant, which shows that the economic benefits of family farms have nothing to do with the business scope of farms.

In land transfer, the significance level of land transfer area from 4 to 7.3 hectares was less than 0.05, coefficient estimated value is $2.479 > 0$, indicating that compared with farms with land transfer area of more than 13.3 hectares, farms with land transfer area of 4~7.3 hectares have significantly better economic benefits. This is because the land operation scale of farms should be adapted to the urbanization process and the scale of rural labor transfer, and to the progress of agricultural science and technology and the

improvement of production means. In accordance with the improvement of agricultural socialized service level, the transfer scale is not the larger the better. Hence, the transfer land area of 4-7.3 hectares is reasonable, which will bring the highest economic benefits.

Among the sales methods, the significance level of online sales is less than 0.05, the coefficient estimated value is $-1.519 < 0$, indicating that in contrast with online sales of farm, there is no network sales of economic benefit from a farm, it also illustrates the farm Uses the network channel sales, the economic benefit will be better, this is because the wide range of customers, sales network sales, as well as agricultural products through the network propaganda, improve product visibility, And the cost of network sales is lower, so it will bring higher economic benefits.

In the financing situation, the significance level of financing cannot meet the demand less than 0.05, coefficient estimated value is $-1.338 < 0$, which indicates that compared to financing can meet the demand of the farm, financing can't meet the needs of the economic benefit from a farm, it also illustrates the farming for financing the dependence of the strong, due to the early stage of the agricultural management mode needs a lot of costs, such as crops, agricultural products can achieve sales cash when completed, the prior need to finance. Farms that can meet the needs of financing. They can expand production, technology, labor and other aspects of investment, have more capital to circulate, but also have higher risk tolerance, so their farms will be better economic returns.

In the case of brand, the significance of no brand was $0.001 < 0.05$, and the estimated coefficient is $-1.285 < 0$, indicating that the economic benefit of unbranded farms is obviously worse than that of branded farms, which also indicates that brand can bring direct economic benefit. This is because brand effect can improve product publicity and customer recognition so that it can bring higher economic benefits to farm.

Conclusions to section 1

The first section discusses the theory and method of family farm development management. The essence and idea of current family farm development are analyzed. This dissertation starts with a necessity analysis, summarizes the advantages of excellent

farms at home and abroad, and finds the management characteristics of family farm development under current commercial conditions. At the same time, according to the current family farms situation, empirical analysis is carried out to find out the relevant factors affecting the development of family farm management, which lays a foundation for the article. The specific conclusions are as follows:

1. Family perfect farm concept definition: family production management and social production management, in line with agricultural production, is natural reproduction and economic reproduction of the unity of the characteristics. It is a new type of agricultural management entity that takes the peasant household as the primary production unit, the family members as the primary labor force, and the farm income as the primary source. It uses the family contracted land or transferred land to carry out appropriate scale management, to realize the commercialization, socialization and intensive production management of agriculture.

2. Formed the definition of the concept of "management of family farm development," the unified management of the whole process of family farm development, and the management system of family farm development is not composed of a single link. Still links influence each other, and should coordinate and improve the management of family farm development. In the current economic background, the development of family farm management should be perfect for digital management should be able to adapt to the development of science and technology. The family farmland circulation can well meet the moderate scale of the development of the family farm, based on Internet +, promote the sale of the family farm produce, based on increasing income, improve the comprehensive ability, provide a better platform for family farm financing, Relying on multi-channel funding, it gives the impetus for the development of family farms and improves the management process of family farm development from various aspects.

3. Summarize the experience of family farm development management in the world. The experience of agricultural development in some developed countries such as the United States, France, the Netherlands, Japan, and the United Kingdom shows that family farm is the primary mode of agricultural production and management in many countries, with clear land ownership and smooth land transfer, which provides the basis for the

large-scale operation of family farms. Family farms mainly adopt modern agricultural production methods for production, with advanced agricultural science and technology, a high level of agricultural mechanization, an emphasis on product brand building, a good financing environment, and a socialized service system for the development of family farms.

4. Identified the advantages of China's family farm development and management, from the government-led family farm model in Songjiang, Shanghai, to the market-led family farm model in Ningbo, Zhejiang, and the market-led family farm model supported by the government in Langxi, Anhui. The analysis results show that the average net income of excellent family farms in these three areas is 120,000 yuan, which is twice that of working outside. The land transfer area is over 90%, and the land transfer area is 1000-3000 subsidy per hectare. The comprehensive quality of farmers is high, and 98% of farmers have participated in more than one training. Social services are perfect, market and brand building are emphasized, and 30 percent of family farm produce has registered trademarks. With the help of the Family Farm Association, strict management is carried out, providing all-around service and guidance in the management process.

5. Through the analysis of the management influencing factors of family farm development, the significance of not receiving agricultural training was $0.001 < 0.05$, and the coefficient estimate value is $-1.103 < 0$, which indicates that farmers without agricultural activity have significantly worse farm economic benefits than those with agricultural activity, and the significance level of not using online sales is $0.000 < 0.05$, the coefficient is estimated to be $-1.519 < 0$, which indicates that compared with farms using online sales, farms without online sales have significantly worse economic benefits. Combined with other results, the management factors hindering the development of family farms in China are an imperfect social service system and impeded land transfer. There is a shortage of professional talents in family farms, a low technical level of family farm employees, an insufficient supply of modern agricultural science and technology, a lack of financial and insurance service platforms, financing difficulties, a low degree of brand of agricultural products, and traditional sales channels.

SECTION 2

ORGANIZATIONAL AND ECONOMIC PRINCIPLES OF MANAGEMENT OF FAMILY FARM DEVELOPMENT

2.1 Analysis of the information component of family farms management

According to the analysis of the management influencing factors of family farm development, science and technology informatization is not perfect in the management of family farm development. Informational agriculture refers to a new type of sustainable agriculture with agricultural information science as the theoretical guidance, agricultural information technology as the tool, information flow to regulate the whole process of farming activities, and information and knowledge input as the main body. It is an advanced stage of agricultural modernization. At the same time, family farm information management is an important engine to promote the improvement of agricultural quality, efficiency, and competitiveness, and realize agricultural and rural modernization [191]. Perfect family farm information service system is beneficial to optimize the allocation of agricultural resources, improve agricultural production efficiency, optimize agricultural supply and demand structure, production structure and regional structure; In addition, the application of advanced information technologies such as the Internet of Things, big data and remote sensing technology in family farm production can be expanded, which is conducive to improving the utilization rate of production factors and labor productivity of family farms, improving the quality of agricultural products and expanding the distribution channels of agricultural products.

China's agricultural modernization must develop family farm information development, agricultural information development has been verified by many agricultural developed countries. For China, to change the uncertainty, volatility and uncontrollability of traditional agriculture, realize the high-speed sustainable development of China's agricultural economy, and promote the development of agricultural technology in various regions, it is necessary to constantly improve the informatization level of family farms. The methods of developed countries have brought

great help to the development and management of family farm informatization. They have important reference significance to the application of family farm informatization in China.

According to literature analysis and research, the author believes that family farm agricultural informatization includes six aspects (table 2.1).

Table 2.1 - Information content of family farm

Classification	Content
Informatization of family farm production management	Farmland capital construction, crop cultivation management, crop pest control, livestock and poultry breeding management, etc
Informatization of family farm management	The purpose is to collect information in time to help farmers solve production management problems
Science and technology informatization of family farm	Timely and accurately provide farmers with all kinds of information related to agricultural operation, such as economic situation, fixed asset investment, price change, and capital flow, and scientifically guide production and operation activities
Informatization of family farm market circulation	Collect and transmit technical progress information related to agricultural production, processing and other fields, including agricultural cultivation technology, livestock and poultry breeding technology, agricultural by-product processing technology and agricultural scientific research trends
Informatization of family farm resources and environment.	Provide information on supply and demand of agricultural means of production, circulation of agricultural and sideline products, income and cost, etc.
Informatization of family farm life consumption	Release information on resources and environment related to agricultural production and operation. Information such as cultivated land, water resources, ecological environment and meteorological environment

Data source: Author's induction and definition

The development of family farm informatization in China can improve the comprehensive management level of family farms. Promote the integrated development of family farms. It can help the government to conduct macro-control on family farms. It can maximize the production factors of traditional family farms. Promote the development of family farm science and technology and the promotion of information technology. Promote the internationalization and globalization of agriculture. Promote the transformation of agricultural economic structure.

By the end of 2020, China's rural broadband penetration rate has reached almost 100%, and rural broadband users have exceeded 100 million household networks. As the number of rural network users continues to rise, 5G, broadband, and other network infrastructure have gradually improved. The construction of rural data resource departments has increased significantly. Which have made great contributions to promoting agricultural production and improving the level of agricultural informatization. The agricultural information service system has also been established. The agricultural information service system has been formed in all provinces, cities and counties nationwide, and the number of agricultural information service personnel has exceeded 140000. According to the comprehensive calculation of relevant data from 2642 counties (cities and districts) in China, the overall level of agricultural and rural informatization development at the county level reached 37.9%, 1.9 percentage points higher than that of the previous year. The national agricultural product quality and safety traceability informatization level is 22.1%, the county-level agricultural product online retail sales account for 13.8% of the total agricultural product sales, the application of information technology to achieve the comprehensive openness of administrative village party affairs, village affairs and finance is 72.1%, the online service rate of county-level government affairs is 66.4%, the administrative village coverage of e-commerce service stations is 78.9%, and the county level financial investment in agricultural and rural informatization is nearly 13 million yuan, The average social capital investment in agricultural and rural informatization at the county level exceeded 30 million yuan. The coverage of county-level agricultural and rural informatization management and service institutions was 78.0%.

According to the "Survey on the Development Index of National New Agricultural Business Entities." A total of 5166 new agricultural business entities were collected in this survey, including 1343 family farm samples. The survey locations involved 23 provinces (districts and cities) in Anhui, Beijing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Heilongjiang, Hubei, Hunan, Jilin, Jiangsu, Jiangxi, Liaoning, Inner Mongolia, Shandong, Shanxi, Shaanxi, Sichuan, Yunnan, and Zhejiang.

Based on the survey data, this dissertation focuses on analyzing the current

situation of family farm informatization in China from the aspects of information demand, information acquisition, information platform application and constraints on agricultural informatization development. Among them, the information demand is mainly measured by the type of information demand, the helpful role of the information obtained and the information urgently needed by the family farm. Information acquisition is measured by the subject of information release and the quantity of information acquisition. The application of the information platform mainly investigated the use of the official agricultural information agency and 12316 information service platform on family farms. Further, the paper analyzes the restrictive factors of the informatization development of the new agricultural operation subject in China. Put forward targeted policy recommendations on how to improve the development level of family farm informatization in China (Figure 2.1).

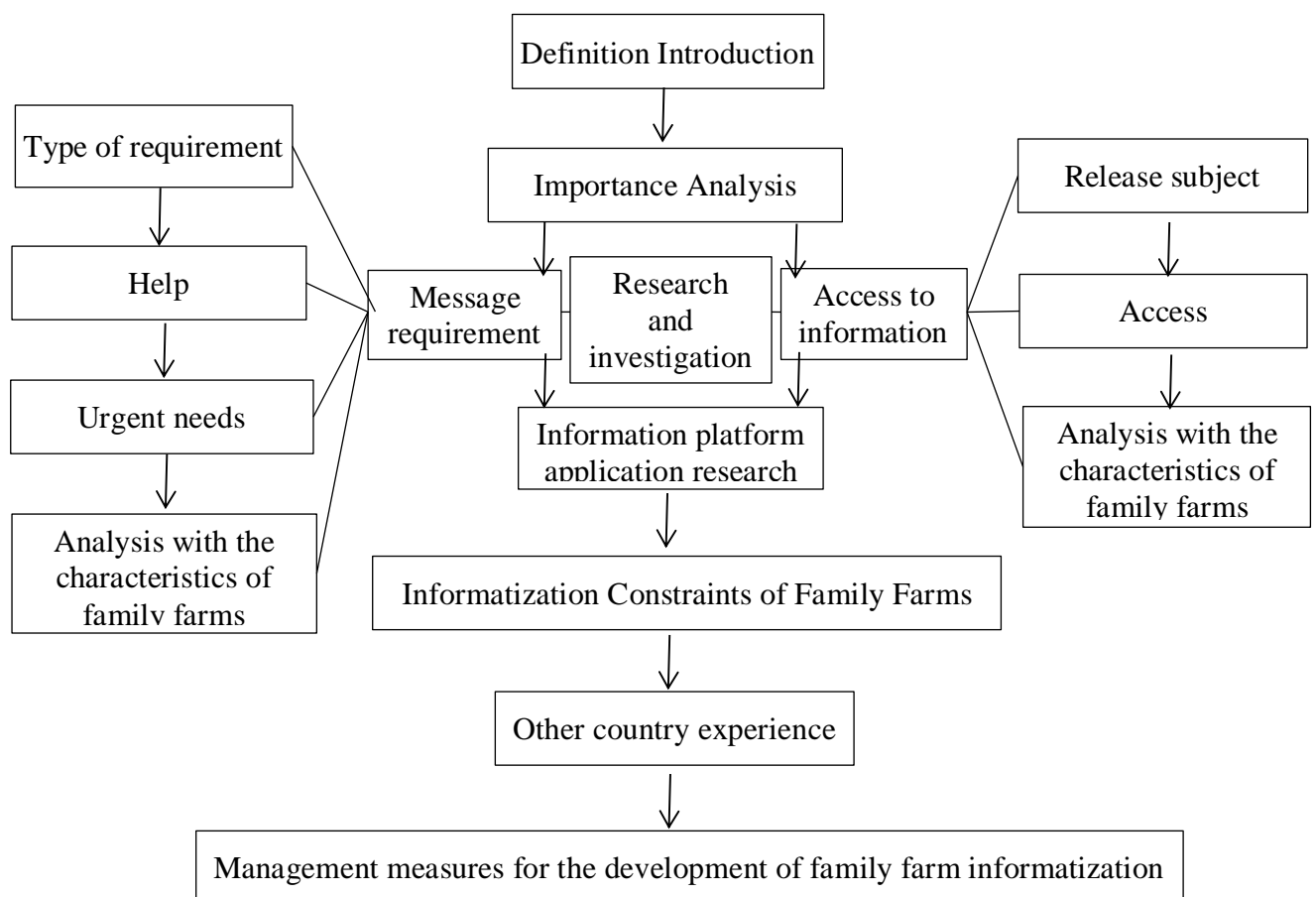


Figure 2.1 - Analysis framework of family farm informatization development management

Data source: Literature collation and research induction

In terms of the types of agricultural information needs of family farm operators. The application of agricultural information technology can improve production and operation efficiency. Family farmers usually obtain corresponding agricultural information based on their own needs, and their ability to obtain information is stronger than that of ordinary farmers. From the type of information demand, most family farms have obtained information on production and operation, agricultural technology promotion, epidemic situation, market supply and demand, brand building, financial supply (Figure 2.2). The agricultural information demand of the main body of the family farm is obviously diversified, and the required information involves the whole process of production and operation.

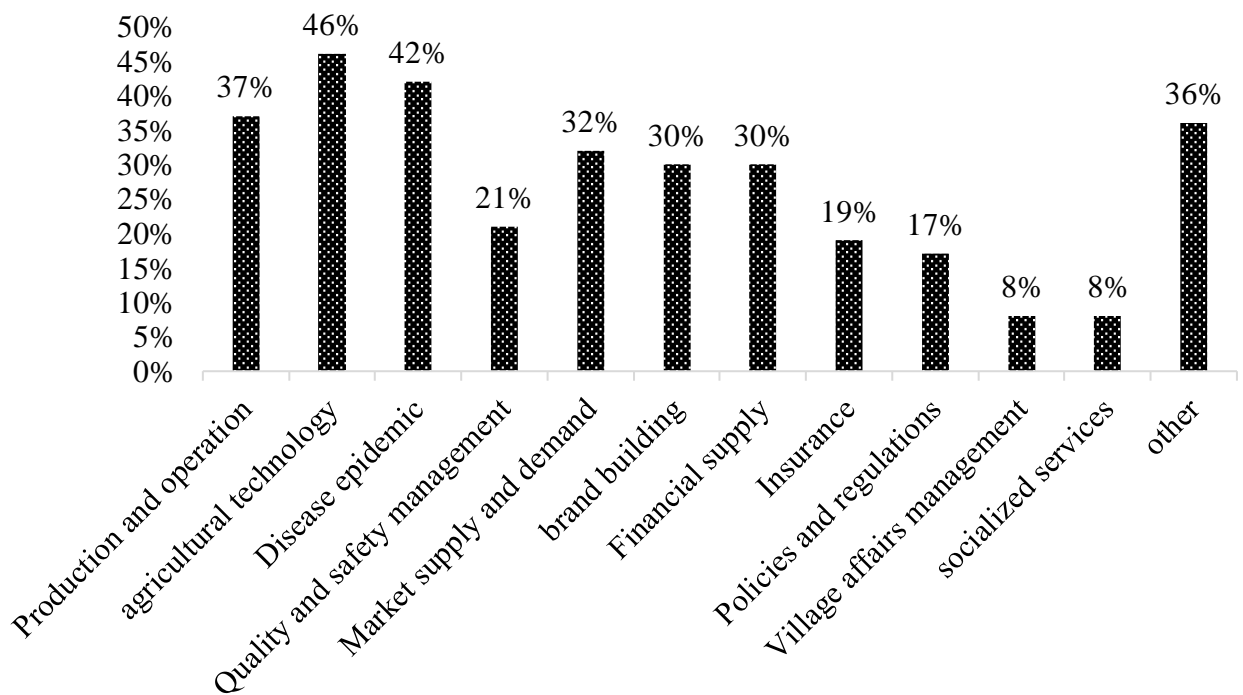


Figure 2.2 - Information acquisition during the production and operation of family farms

Data source: Data statistics and sorting

From the perspective of the help role of the information obtained by the family farm, in the help role of the information obtained by the family farm in the production and operation process (Figure 2.3). The agricultural technology promotion, epidemic situation and market supply and demand information have the largest help role for the

family farm. In terms of the help of information on family farms, 28% of the respondents believed that agricultural technology extension was the most helpful to their production and operation, followed by the epidemic, market supply and demand and production and operation, followed by epidemic disease, market supply and demand and production and operation. Specifically, the order for family farms for agricultural information is mainly concentrated on the production side.

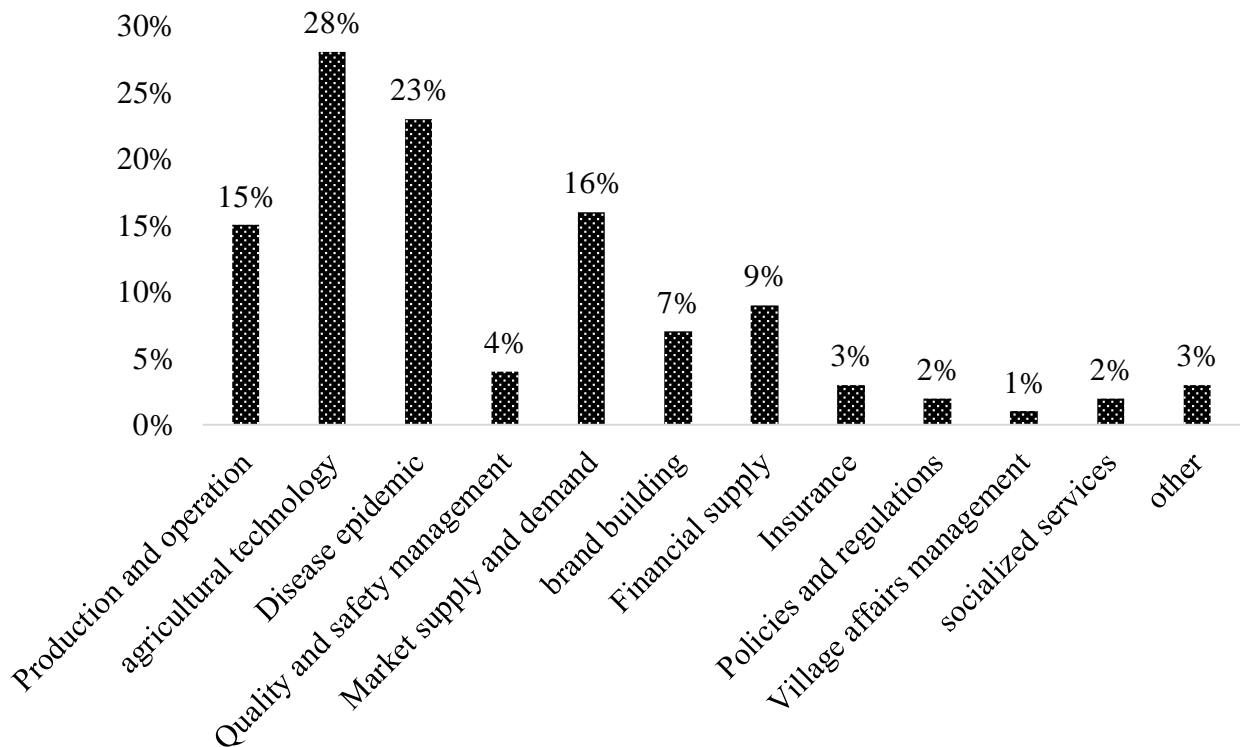


Figure 2.3 - Proportion of information technology to family farm production and operation

Data source: Data statistics and sorting

From the perspective of the most urgently needed information of family farms, the most urgently needed agricultural information usually helps family farms reduce business risks, improve management levels, and save operating costs. However, due to insufficient understanding of the information urgently needed by family farms, it is often impossible to provide effective information in a timely manner, which directly leads to insufficient and unbalanced agricultural information supply and affects the improvement of

agricultural production efficiency of family farms. Make statistics on the type and proportion of information urgently needed on family farms (Table 2.2). It can be seen that market supply and demand information is the most urgently needed (29.27%) by family farms, followed by agricultural technology promotion information (22.09%) and epidemic information (14.75%).

Table 2.2 - Type and proportion of information urgently need by family farms

Information category	First Urgency	Second Urgency
Production and operation	11.79	12.44
agricultural technology	22.09	18.91
Disease epidemic	14.75	14.33
Quality and safety management	2.89	5.44
Market supply and demand	29.27	19.89
brand building	1.68	3.42
Financial supply	5.38	5.90
Insurance	1.21	3.39
Policies and regulations	5.39	5.93
Village affairs management	0.27	0.55
socialized services	0.55	1.37
other	4.72	8.43

Data source: Data statistics and sorting

From the above analysis, it is found that family farms promote the management of family farm development based on family operation and by means of selling family farm agricultural products. Therefore, the urgent demand of market supply and demand comes first, which is also an important basis for family farms to produce according to market conditions, and is also the embodiment of the most direct economic benefits. At the same time, family farms are mainly engaged in planting and breeding production, The demand for agricultural information is concentrated on the production side. Information on agricultural technology promotion, production and operation, and epidemic situation can effectively improve the production efficiency of family farms, accelerate agricultural transformation, and improve the modern development and management of family farms.

The main body of information release is also an important aspect of promoting the information management of Chinese family farms. Since the implementation of the project of information entering villages and households, the main body of agricultural information supply has expanded from the top to the bottom, and all regions have made

efforts to build a horizontal and vertical information supply network. For family farms, the information publishing bodies are diversified (Figure 2.4). Among them, the information service institutions of governments at and above the county level are the most important information publishing bodies, followed by the market. Government information service agencies and market information service agencies above county level jointly form horizontal and vertical information supply networks. In addition, family farms and cooperatives also obtain a large amount of agricultural information from grassroots information providers such as township information stations and village information stations. Family farms and these types of information publishers are located in more overlapping locations, have more frequent contacts, and have more access to information and higher convenience.

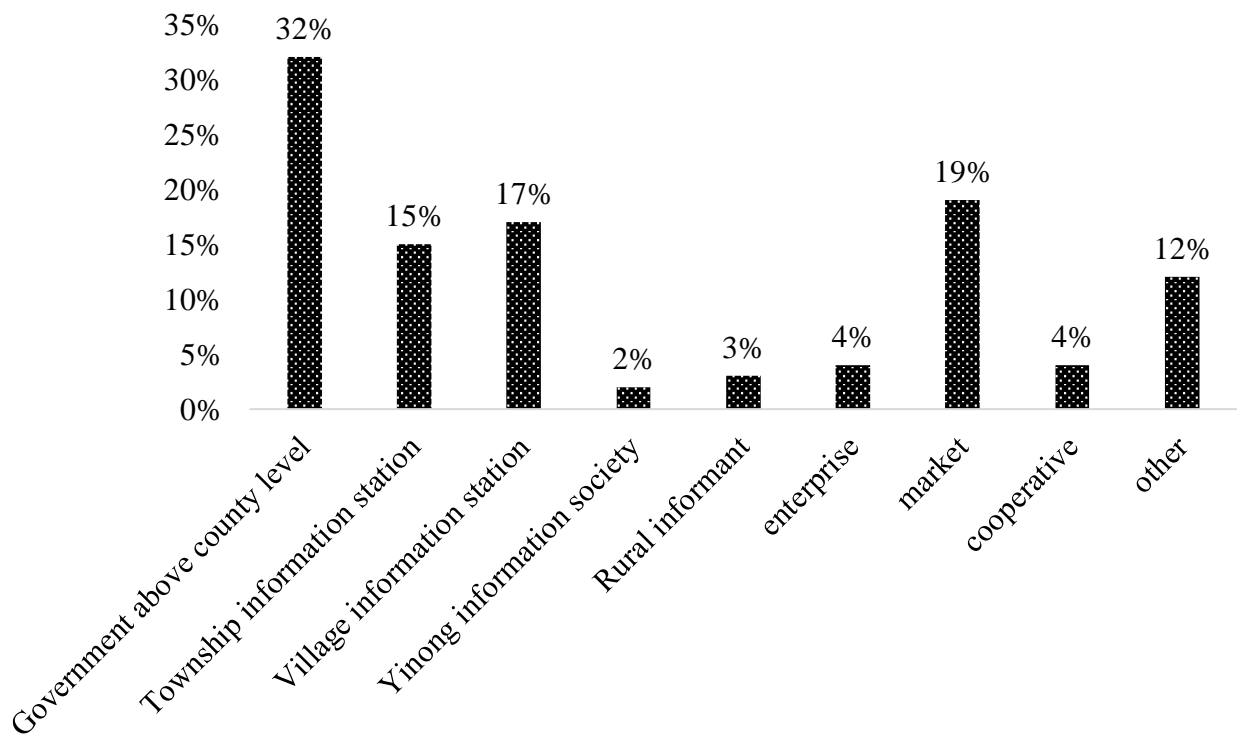


Figure 2.4 - Proportion of information release subject's assistance to family farm production and operation

Data source: Data statistics and sorting

The abundance of access to agricultural information is a concrete manifestation of whether the information supply is adequate. Family farms have multiple ways to obtain their production and operation information (Figure 2.5). Paper newspapers, government

publicity platforms, the Internet and communication media are common ways to obtain the agricultural information they need. Among them, the Internet and mobile phone SMS/phone are the most important ways for various new agricultural business entities to obtain information that can help production and operation most, and TV, newspapers/books are also important ways to obtain information. At the same time, the proportion of family farms obtaining information from mobile phone APP, radio, bulletin boards or electronic screens, 12316 information platforms and other channels is small, because all kinds of subjects are unfamiliar with the above ways of obtaining information, the construction of information channels is not complete, and the role of information obtained through these ways is limited.

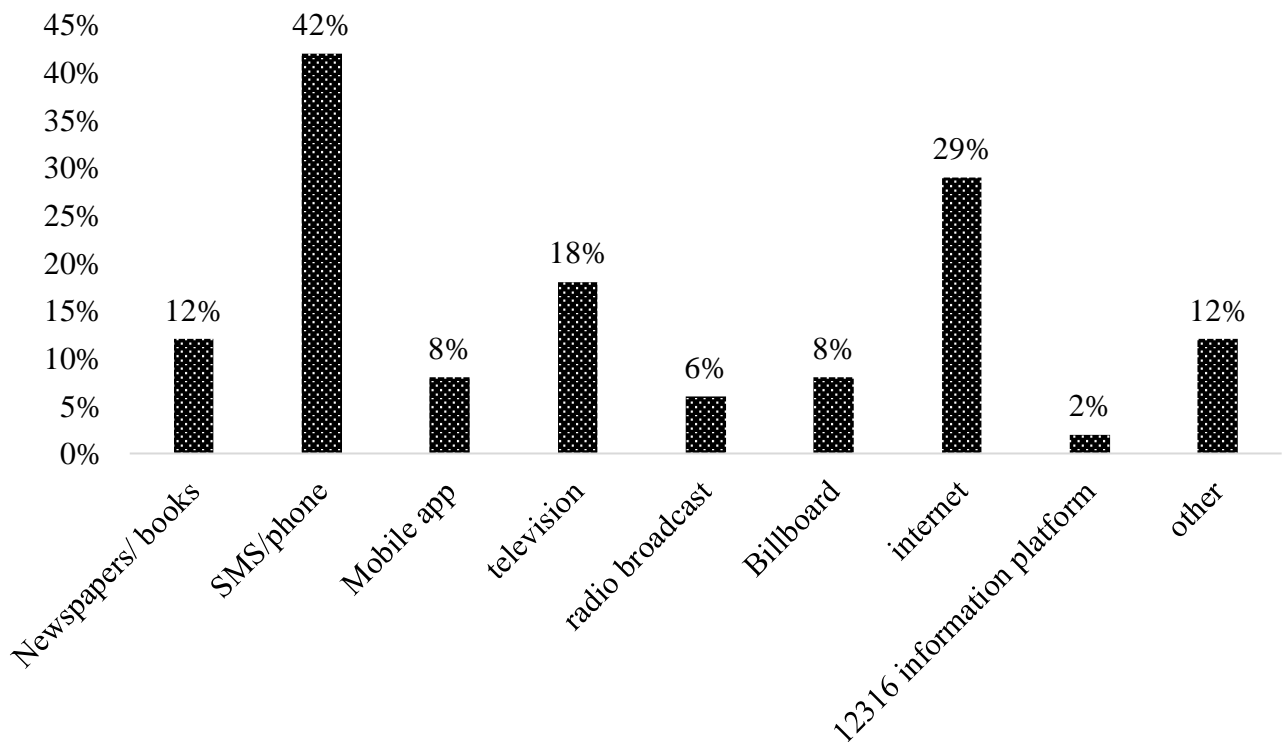


Figure 2.5 - Proportion of information access to family farms

Data source: Data statistics and sorting

According to the above survey, the main body of information release and information access are diversified, indicating that China's current agricultural informatization construction has made remarkable achievements. However, through the analysis of the proportion of information release subjects and access ways, the main release subjects and access methods of information obtained by family farms are

relatively centralized. For this phenomenon, in addition to the consistent preferences of different family farms, another possible reason is that the imperfect construction of information release subject and information receiving hardware limits the possibility of family farms obtaining more beneficial information from other ways, resulting in a single way of information release subject and family farmers receiving information. From the perspective of the subject of information release, in addition to government information service agencies, family farms also have a lot of information obtained from grassroots information release agencies; From the perspective of information access channels, the most important way for family farms to get information is simple text messages or phone calls. Modern information communication channels contain more and better information resources. However, application level of family farms to these information communication channels is still low, and there may be a gap between the information actually obtained and the demand.

Family farms in the case of the Agricultural Information Platform. In 2014, China began to accelerate the development of agricultural informatization. In 2014 and 2015, the Ministry of Agriculture carried out the pilot work of "information entering villages and households" in 116 counties of 26 provinces in two batches. It was carried out nationwide from 2016 to 2017. In 2017, we fully implemented the project of information entering villages and households, carried out demonstration work in 10 provinces and cities across the country, and made specific arrangements for the construction of farmers' information cooperatives, the selection and training of village-level informants, etc. However, according to the survey on family farmers, the question of "whether there is a Huinong Information Station near your home" shows that 1201 of 1343 family farms have no Huinong Information Station near their home farms, and only 142 family farms have used the services provided by the Huinong Information Station. As can be seen from Table 2.3, 45.78% of operators use the services provided by the Huinong Information Station less than 10 times a year, and the frequency of use is relatively low. Only 19.01% of them were used more than 500 times.

12316 is a special number for public welfare services in the agricultural system opened nationwide. The platform provides farmers with all-round and real-time

information services such as technology, market, policy and price. At present, the country has opened 12316 "three rural" service hotlines, but according to the survey results, Only 102 out of 1,343 family farms have used 12316 information service platform, and the frequency of use is low. Table 2.3 shows that 41.18% of operators use the services provided by 12316 platforms less than 10 times a year.

Table 2.3 - Frequency of use of Yinong Information Society and 12316 platform

Frequency of use (One year)	Yinong Information Cooperatives% (number)	12316 platform% (number)
1-10	45.78 (65)	41.18 (42)
11-15	20.42 (29)	31.37 (32)
16-50	14.79 (21)	12.75 (13)
51-200	8.45 (12)	7.84 (8)
201-500	5.63 (8)	1.96 (2)
Above 500	4.93 (7)	4.90 (5)

Data source: Data statistics and sorting

There are many reasons for the family farms to use the agricultural information platform less and less frequently. First, there are few information organizations, which makes it inconvenient for family farmers to use. For example, the coverage of Huinong Information Station is insufficient, and the distance from family farms makes it inconvenient to use. Secondly, the application of information platform by family farmers has weak subjective initiative and is mostly used passively. They have not formed the habit of actively obtaining information from the information platform according to their own needs; Thirdly, family farms have a greater demand for information on the production side, and the information on the production side is often geographically different. It is difficult for general information platforms to provide detailed, in-depth and systematic information services. Finally, the mismatch between information supply and demand may also reduce the operator's trust in the information platform, thereby reducing its use and frequency of use of the information platform.

According to the above analysis, the main factors restricting the development of family farm informatization in China include the following:

The family farm information service system and pertinence of information service lack of in-depth and systematic understanding of farmers' information needs. The

majority of family farmers urgently need information related to agricultural production, such as agricultural product market supply and demand information, production technology services, future price forecasts, migrant workers and other information. However, most agricultural website information services are limited, the effective information supply is insufficient, and the information quality is not high, especially the information that can better analyze agricultural product production and market conditions.

In informatization construction, the government's leading role is weak, lack of laws and regulations. The government lacks overall planning. The informatization construction of family farms involves government, agriculture, information, commerce, meteorology and other departments. However, each region lacks a unified competent agricultural information department, long-term development planning and policy support system, and each department also lacks specific implementation planning, less contact, and lack of overall planning, which often leads to repeated construction and waste of resources. Legislative work lags behind. The information market management of family farms lacks laws.

Farmers' ability to access information resources is not strong. First, the cost of using the network is high, and there is a lack of low-cost information terminals. The income level of farmers is generally low, but the cost of installing broadband, using networks, and computers is high, which exceeds the economic affordability of most farmers. Farmers get less information.

The effective application of information technology in family farm production is insufficient. The slow application of new technologies such as big data, remote sensing technology and the Internet of Things in the production of family farms is due to the lack of trust in information technology, which is a new thing, and the need for certain costs and skills; The cost of hardware and software of any new technology that should be used in early production is relatively high. In the initial use stage, if the government support is insufficient, farmers rarely use this technology; The technical level of grassroots information service personnel is limited, and many farmers' knowledge level and ability are not strong, which are not conducive to the use of new technologies.

The construction of information systems is slow. Information systems applied to

family farm management and service in various regions, such as agricultural information websites, video conference training, agricultural product quality traceability origin code, distance education training, office automation, agricultural material credit management, animal epidemic prevention and quarantine management, rural financial supervision and other information construction, application, promotion and improvement are very slow. Only pilot projects have been started in developed regions, mainly due to the lack of long-term planning for information system construction, The information technology is frequently updated, and the maintenance and upgrading of the system, updating and adaptation of the application personnel need a process.

The information service subject lacks power Although the government, enterprises, farmers' cooperative organizations and other subjects participating in family farm information services are increasingly diversified, their enthusiasm is affected to give full play due to the low efficiency. According to the above status and analysis of the status quo, this paper, based on the actual visits and questionnaires, summarized and analyzed the survey results, processed the data of the government's official institutions, combined with foreign experience, systematically investigated the status quo and existing problems of informatization, and proposed the following measures to deal with the informatization of family farms. Accelerate the informatization construction of family farm management in China.

In the information construction, give full play to the leading role of the government, improve the family farm information laws and regulations system. Perfect laws and regulations are conducive to safeguarding the rights and interests of family farm information subjects, and ensuring the authenticity and effectiveness of family farm information; It is conducive to fair and equitable distribution of information resources, resolving various disputes arising from unfair distribution of information resources, and realizing information resource sharing; It is conducive to strengthening the protection of intellectual property rights and handling the relationship between information protection, information disclosure and sharing; It is conducive to restricting the behavior of all parties in the market and preventing false information from going online; It is conducive to

building a fair and equitable market competition environment, so as to promote the healthy and orderly development of family farm informatization.

Formulate preferential policies for informatization construction of family farms. Government departments set up support projects and special funds to encourage the development and innovation of family farm information technology; Implement an incentive mechanism to reward individuals or units who have made outstanding contributions. Encourage more enterprises or individuals to invest in the informatization construction of family farms; When enterprises invest in family farm information construction projects, banks give priority to project establishment and approval; When purchasing advanced information equipment, There should be tax incentives or subsidies for family farms.

Establish a unified information standard system. To ensure the accuracy and standardization of market information, a unified classification standard is used to standardize the management of family farm information. First, formulate unified management standards for all stages of information resources from collection to application. Second, we should formulate unified specific standards for information classification and information application environment, fully consider the needs of farmers, increase applicability, avoid waste of family farm information resources, and achieve efficient use of resources. Third, in terms of information technology. Implement standardized management. All index terms involved in network construction, data transmission and sharing should also be standardized to ensure smooth information resource construction and information resource sharing. Fourth, in the development of family farm information software, the realization of standardized management is conducive to saving resources and linking up various links. Fifth, to formulate standards for scientific systems in all aspects of information construction, such as information platforms, databases and application systems.

Improve the information infrastructure of family farms. Further improve rural network infrastructure and communication facilities, make the network cover all rural residents, and achieve the goal of making more people use the Internet. At the same time, it improve the network speed, improve the network transmission capacity, and give full

play to the advantages of the network. We will promote balanced development of family farm information infrastructure. We will strengthen the construction of rural information service platforms, large databases of rural information resources, and rural grass-roots agricultural information websites in remote areas such as the central and western regions, and increase the amount, timeliness, and updating speed of information.

Establish a complete family farm information service system. Continuously improve the family farm information service platform. Build a national information commonweal platform, and provide various information services such as commonweal, convenience, and information release of agricultural product supply and demand. Establish a remote video technology service platform, timely promote new practical technologies, spread modern agricultural science and technology, and hire experts to solve the technical needs of grassroots people. Establish an agricultural mobile phone service platform, incorporate planting, breeding, agricultural product processing and other technologies into the platform, and train farmers on mobile phone skills, so that farmers can understand the actual problems in production and life at any time through mobile phones increase farmers' ability to use and access information. Strengthen the training for farmers to use mobile phones, computers or the Internet, improve their ability to receive various kinds of information, master the skills of applying information technology, establish a set of standardized training systems based on the actual situation, regularly run training courses, publicize and popularize family farm information knowledge, and cultivate farmers' awareness of modern market information.

Accelerate the application of information technology in family farm production and life. Carry out big data pilot work in family farm production and life. Do a good job of big data from the whole process of production, processing and consumption. Through the Internet, we analyzed the information data of agricultural products in previous years, such as the amount of cultivation, output and sales volume, to help farmers predict the demand for agricultural products in the market, to avoid losses to farmers and the country caused by the gap between supply and demand. The Internet of Things technology will be applied to the production and life of family farms. That is to manage the materials needed in the production process of the family farm through the network. For example, in the

production process of sowing, watering, fertilizing, spraying pesticides, etc., the Internet of Things technology is used to control the quantity of water, pesticides, fertilizers and pesticides, reduce labor, save costs, and implement precision operation and precision control for the production of the family farm. Strengthen the construction of the informatization talent team of family farms at all levels.

2.2 Organizational and economic aspects of land use of family farms

Under the current economic background, the effective use of land can promote the stable and healthy development of individual enterprises and the national economy. The land is the basis of all agricultural activities. Agricultural development needs land, rural prosperity needs land, and farmers need land to become rich. The land has different functions in different periods (table 2.4). With the continuous advancement of the overall construction process of the new countryside, the original regulation, management, and planning forms of the rural economy have put forward innovative requirements.

Table 2.4 - Functions of the land in terms of stages of development

Main stage	major function	Main features
The first stage (about 1978)	Social and political stability function	Planned allocation, equality
The second stage (1978-1984)	Social and political stability function is the main function, supplemented by economic function	The preliminary determination of the micro dominant position of the rural market and the substantial growth of grain supply
The third stage (since 1984)	Economic function is the main function, supplemented by social stability function	The structural surplus of agricultural products, the adjustment of agricultural industrial structure has brought about the improvement of agricultural land income, and the transfer of agricultural labor
The fourth stage (starting from a certain period in the future)	Maximization of economic function and potential social stability function	The agricultural industrial structure is becoming more and more rationalized, the agricultural labor force is transferred to families, and the market-oriented allocation of land resources is high.

Data source: Literature collation and research induction

Given the current development situation of diversified land transfer forms, expanded scale, accelerated speed. Diversified subjects, the management department needs to strengthen the union with enterprises, economic units and other relevant

organizations, and formulate a standardized management mechanism from the perspective of overall and long-term development, Strengthen the supervision of the circulation process, reasonably play the role of policy guidance, mobilize the enthusiasm of farmers to participate in the reform, and comprehensively and orderly promote the realization of the goal of new rural construction [192].

Land is so important to Chinese farmers that it can even be reflected in the fact that land circulation is still in slow growth for a long time. In fact, despite the accelerated land transfer in recent two years, most farmers prefer to leave their land idle rather than give up their land occupation due to the lack of standardized land transfer mechanism. As a result, in the country with the most serious human-land relationship in the world, there are strange phenomena, such as highly scarce land resources on the one hand, land management, lease and wasteland on the other. How to improve the effect of land resource allocation is not only a major problem concerned by the government and society, but also a problem that farmers hope to deal with in terms of economy. At present, China's rural land use is decentralized, the scale of operation is low, and the rate of land lease is small, which inevitably restricts the improvement of China's agricultural land allocation efficiency from two aspects: one is to hinder the process of agricultural technology transformation; First, it hinders the transformation process from traditional agriculture to modern agriculture. Therefore, it is important to focus on building the formation mechanism of rural land transfer in China [193].

With the continuous innovation of the circulation mode of rural land use rights and the establishment of China's market economic system, the research on the market circulation of rural land use rights starts. With the change of land transfer mode, from the period of helping farming and exchange, it began to lease and share in a variety of ways. The land transfer between farmers is paid, and the collective land contract has been the main content of the land market in recent years. The area of agricultural land circulation in China is on the rise, The circulation mechanism is gradually formed (Figure 2.6). By 2020, the area of cultivated land contracted by Chinese family farms will be 104.2 million hectares, an increase of 1.0% over the previous year; The number of households contracted farmers was 220.6 million, an increase of 0.2% over the previous year; 210.8

million land contract management certificates were issued, an increase of 3.1% over the previous year.

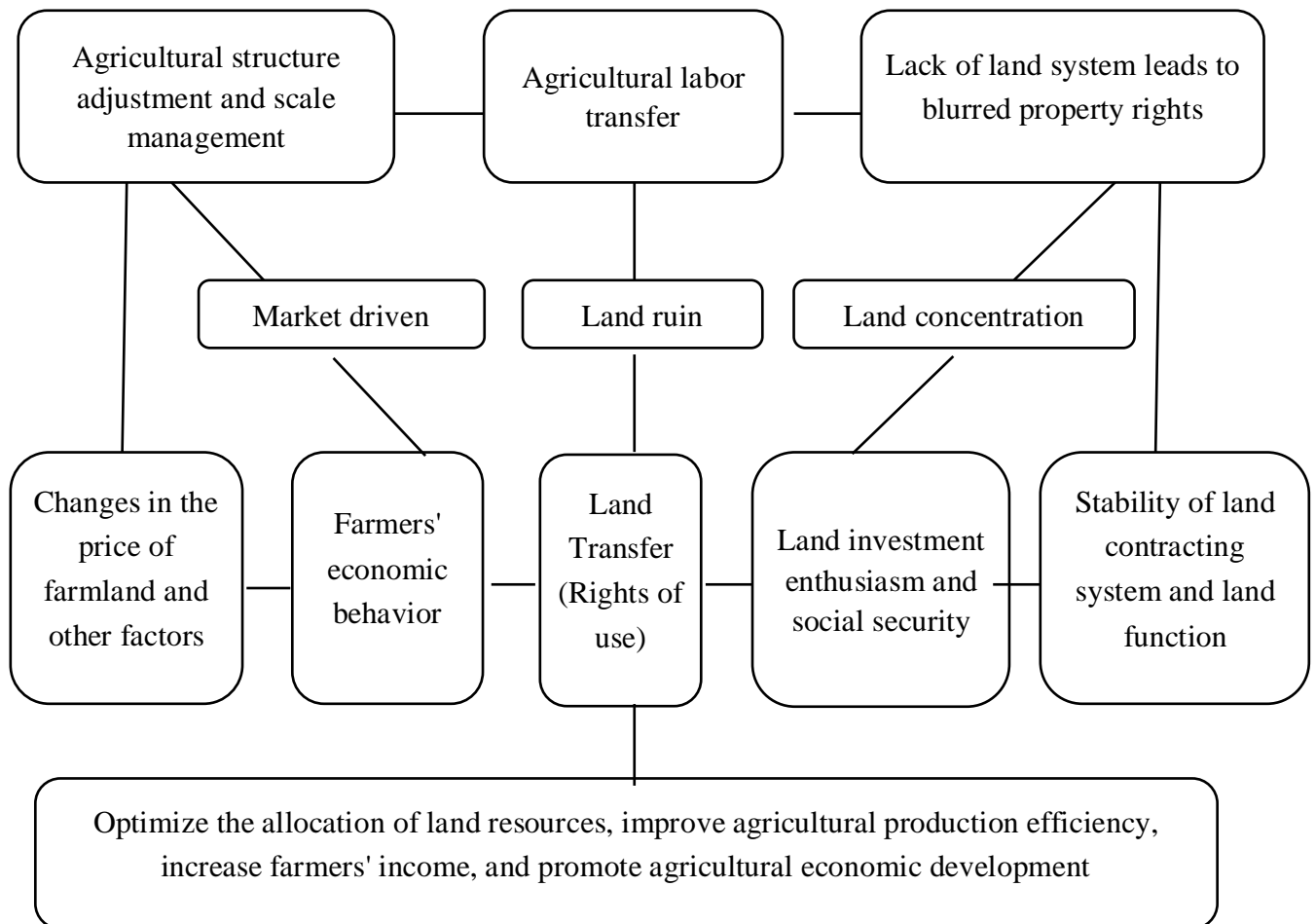


Figure 2.6 - The formation mechanism of rural land circulation

Data source: Literature collation and research induction

In 2020, the land circulation area will be 35.5 million hectares, an increase of 4.3% over the previous year, including 31.7 million hectares leased (subcontracted), an increase of 6.5% over the previous year; The area of shares was 1.9 million hectares, a decrease of 11.5% over the previous year; The circulation area in other forms was 1.8 million hectares, a decrease of 10.0% over the previous year. The scale of rural land transfer in China is expanding year by year, and the scale of operation is on the rise. According to statistics, at present, the proportion of rural land transfer in China accounts for 26% of the country's cultivated land area. The main destination of the transfer of cultivated land is still farmers. For example, the contracted land transfer area in Hebei Province in 2020 will be 1.2 million hectares. The scale of farmland circulation in Sichuan Province has

maintained a steady growth trend. The total area of family farms contracted farmland circulation has reached 0.9 million hectares, an increase of 13.8% over the previous year. The farmland circulation rate has reached 23.3%, an increase of 2.8 percentage points over the previous year. 2.1 million transfer contracts were signed, an increase of 13% over the previous year. The transfer area of farmland signed was 483.3 thousand hectares, accounting for 53.3% of the total transfer area.

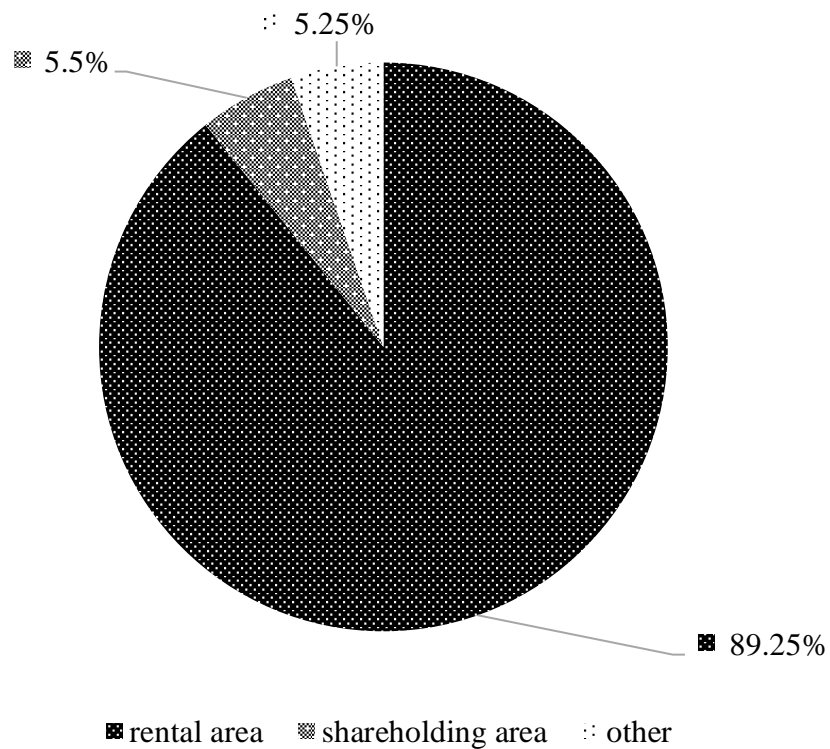


Figure 2.7 - Proportion of land circulation area in China in 2020

Data Sources: [https://xw.qq.com/cmsid/20211005A0BQWE00?pgv_ref=baidutw\[194\]](https://xw.qq.com/cmsid/20211005A0BQWE00?pgv_ref=baidutw[194])

In 2020, the area of land management rights transferred to farmers will be 16.6 million hectares, The area transferred to family farms is 4.7 million hectares, The area transferred to professional cooperatives is 7.6 million hectares, The area of transferred enterprises is 3.7 million hectares, The area transferred to other subjects is 2.8 million hectares.

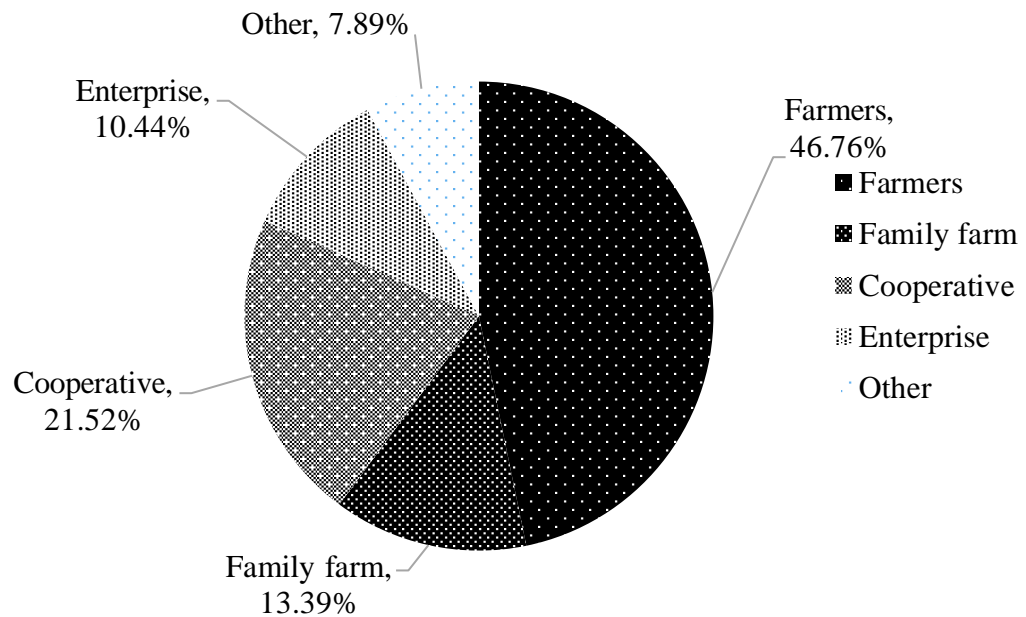


Figure 2.8 - Proportion of land transferred in area in 2020

Data Sources: https://xw.qq.com/cmsid/20211005A0BQWE00?pgv_ref=baidutw [194]

According to the total provincial points of the circulation of household contracted farmland, the distribution of each region is very uneven. Farmland circulation area the top 10 provinces (cities) with a large proportion of contracted land area are Shanghai 60%, Beijing 48%, Jiangsu 43%, Zhejiang 42.3%, Chongqing 40.2%, Heilongjiang 32%, Guangdong 27.8%, Hunan 24%, Henan 23%, Fujian 21.2%. The 10 provinces (regions) with large increases in circulation area over the previous year are Gansu 89%, Henan 52%, Shanxi 51.1%, Hebei 47%, Ningxia 43.3%, Liaoning 41.1%, Hubei 37%, Guizhou 31.2%, Shandong 29.3%, Anhui 28.8%.

Rural land circulation is an important means to promote the intensification, large-scale operation and effective management of rural land. It is also an important part of promoting farmers' income and improving the efficiency of land resource utilization. In recent years, the state has issued a series of land contract management policies, which have promoted the land transfer to scale and marketization. The forms of land transfer are increasing, the business organizations participating in the transfer are expanding, the enthusiasm of farmers for land transfer is improving, and the agricultural economic

benefits are increasingly obvious, which has become an important guarantee for farmers to get rid of poverty and live a prosperous life. However, in the continuous promotion of rural land transfer, there are also some difficult problems and constraints.

Land transfer agreements and contracts are not standardized. The earliest form of rural land transfer was mainly private transfer between farmers. There was no agreement or contract, and most of them adopted oral agreement, which caused many disputes. In recent years, with the gradual improvement of laws and regulations, both parties involved in land transfer have written agreements. However, due to unclear rights and responsibilities in the agreement, incomplete terms in the signed contract, non-standard behaviors in the transfer, and the fact that most of the provincial (municipal) rural land contracting dispute arbitration institutions have not been established, there is no authoritative arbitration institution to deal with relevant matters in a timely manner, resulting in potential disputes.

The legal mechanism in the process of rural land transfer is not sound enough. In the early 1980s, China made clear the legal status of rural land transfer. The General Principles of the Civil Law promulgated in 1986 and the Constitution promulgated in 1988 strictly stipulate that the land use right can be transferred according to law. In 2002, China's Rural Land Contract Law stipulated that disputes arising from the contracted management or circulation of land can be submitted to the villagers' committee, the township (town) people's government or the rural land contract arbitration institution for arbitration,

They can also bring a lawsuit directly to the people's court. The Property Law promulgated in 2007 stipulates that: "The holder of the right to land contractual management (by the Rural Land Contract Law) has the right to transfer the right to land contractual management through subcontracting, exchange, transfer and other means. Without legal approval, Contracted agricultural land cannot be used for non-agricultural construction." Therefore, the legal norm of the rural land transfer has experienced a process from scratch to existence and standardization day by day. However, in the long-term development, the legal mechanism and local regulations of land contractual management and transfer in China are not sound enough, leading to the spontaneity,

blindness, and arbitrariness of some rural land in the transfer, and land disputes and torts occur from time to time. In addition, many legal provisions are too general, and the relevant contents and procedures lack operability, which makes it difficult to solve problems and disputes.

Some farmers do not have a good understanding of rural land transfer. At present, as China's urbanization process continues to advance, land acquisition and demolition efforts continue to increase, farmers see greater potential value and economic benefits of land, affecting the enthusiasm and initiative of farmers to participate in rural land transfer. At the same time, some cadres have insufficient awareness of the importance of moderate-scale operation through the transfer of land contractual management rights, insufficient attention, poor guidance and inadequate coordination services, which have made some local land transfers spontaneous among farmers and affected the orderly promotion of rural land transfer. In addition, some farmers do not know enough about the relevant policies of the country's rural land transfer. They are worried that the land transfer will affect their interests. Farmers prefer extensive management rather than transfer their land, which hinders the process of rural land transfer and the rapid development of rural economy.

Financing difficulties have restricted the large-scale operation of land. Farmers need to contract land on a large scale for large-scale operations, which requires large capital investment to engage in efficient agricultural development. However, farmers generally have few loan guarantee units, and they cannot mortgage the land use right, which makes many large agricultural households have a shortage of funds for land development and utilization, affecting the progress of large-scale operation of land transfer. In recent years, the country and all provinces (cities) have successively issued documents to speed up land transfer and promote large-scale operation, especially to establish a land management right transfer market and encourage the introduction of financial policies to support agriculture. However, loans are often not available before land is ready for introduction, and the funds needed to lease land must be raised on their own, which hampers the expansion of operations.

The participation of intermediary services and government agencies is low. For a long time, affected by the self-sufficient production mode in rural areas and the circulation of rural land use rights mainly due to the spontaneous reasons of farmers, some family members worked abroad all year round. The circulation relationship is unstable, the government (collective organization) lacks coordination services, and farmers are not closely connected with the market, which limits the flow of land use to the market. In addition, the per capita area of rural land owned by farmers is small, and the motivation for their own participation in the market is insufficient. It is easy to be in a disadvantageous position to negotiate through intermediary market transactions. The possibility of failure in land transfer negotiations is large, which affects the injection of rural land into the market. Moreover, the family contract system of rural land affects the function of rural collective organizations, and the opportunities for information exchange between farmers and collective organizations are gradually reduced. At the same time, because the functions and roles of government departments and intermediary organizations in supervising and protecting land ownership in the process of land transfer have not been fully played and implemented, the rural land use right has not entered the operational framework of the market economy mechanism. As a result, the information sources and quantity of farmers' decision-making information are insufficient and lagging behind, the effectiveness of preferential policies for farmers and the scale operation of rural land have not been effectively combined and fully developed, affecting the opportunities and effectiveness of land transfer to enter the market.

Lack of market mechanism in land transfer. In recent years, with the establishment and improvement of China's rural market economy system, the phenomenon of farmers' land transfer has become more and more. Still, the direction of marketization is not obvious enough. Many farmers subcontract this land to their relatives and friends. Land transfer is mostly between relatives and friends, often without any rent. Moreover, in the land circulation with market attribute, the problems of small scale, decentralization and low efficiency of rural land resource allocation still exist. Market mechanism has not been realized in land transfer. There is no effective competition in the process of land transfer, and the expected benefits of land transfer have not been realized.

According to the above analysis of influencing factors of land transfer, combined with the current situation of family farmland transfer in China, it is obvious that the formation of market mechanism is the basis for family farmland transfer and improving efficiency. Proceeding from the actual situation in China, playing the basic role of market mechanism in land transfer is of great significance for land transfer in China. There are still many problems in the marketization of rural land transfer. To overcome the imbalance between supply and demand of agricultural land, market factors should be introduced into land circulation. However, the market often has some shortcomings, and the government should play an economic and political role. The government's macro-control must play an appropriate supporting role, but it should not be too cumbersome. Establish a reliable social security system for the rural population and farmers. At the same time, with the development of urbanization, the interaction between closed and backward rural areas and cities has gradually increased, and more rural population has transferred to cities (Figure 2.9), providing a basis for the transfer of family farmland.

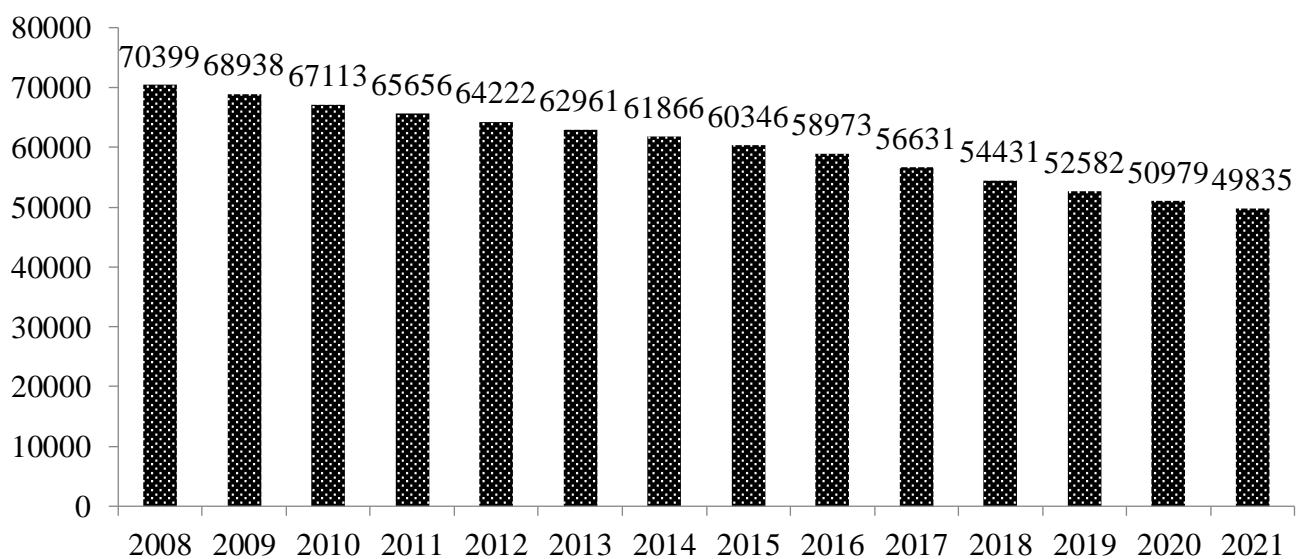


Figure 2.9 - 2008-2021 Rural population of china. (Unit: 10000 people)

Data Sources: [http://yte1.com/datas/pp-village-toal\[195\]](http://yte1.com/datas/pp-village-toal[195])

Land transfer is not only conducive to activating rural land transfer, but also can play a certain role in promoting rural economic development. Establish and improve a scientific and effective guidance and evaluation mechanism, strengthen the management of land transfer activities, speed up the construction of service platforms, so that the rural

land transfer can be carried out smoothly, thus promoting the development of rural economy. The three elements of the market mechanism of rural land transfer in China generally include price mechanism, supply and demand mechanism, and competition mechanism. (Figure 2.10).

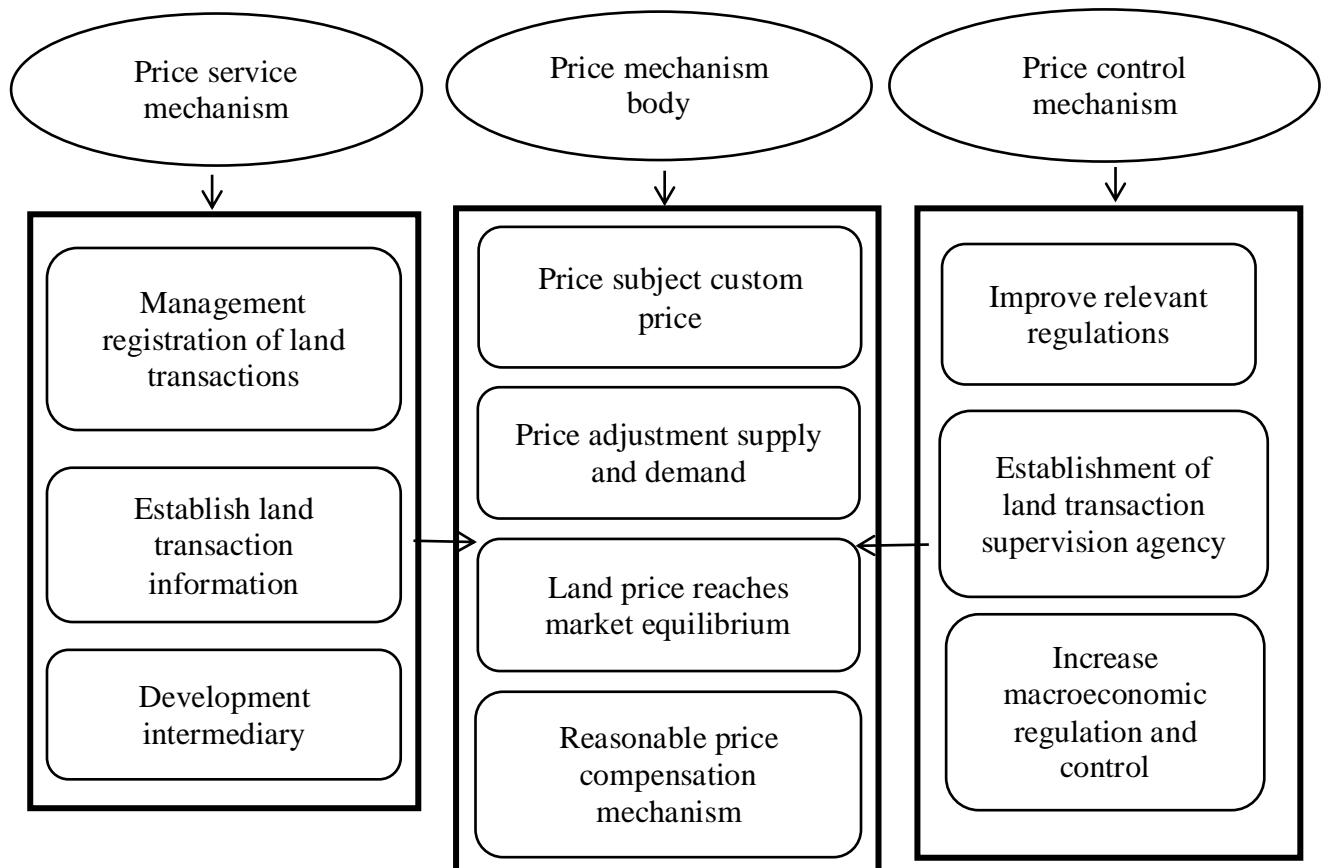


Figure 2.10 - Land transfer supply and demand price mechanism

Data source: Literature collation and research induction

Innovate the land circulation carrier and implement the new land stock cooperation system. Set up a land evaluation team to evaluate the transferred land, convert it into shares and distribute it to farmers. A land joint stock cooperative shall be established. The general meeting of shareholders elected leaders to exercise land ownership, use rights, and management rights. The land share cooperation system enables farmers to obtain real property rights and management rights, thus participating in market operation. Gradually improve the agricultural land market system, the rural land transfer market should establish a market system including the ownership of agricultural land, the right to use

and the rural financial market according to local conditions. The main task of this market is to establish modern agricultural services and accelerate land transfer. Because the market itself has its drawbacks, we must join the national macro-control. Agriculture is not only a food and economic issue, but also a political issue. In the process of rural land transfer, we should always pay attention to this problem, which determines that the rural land transfer behavior should be macro-control, make up for the defects of the market mechanism of land contractual management right transfer, build the defects of the market mechanism of rural land contractual management right transfer, and achieve sound and rapid development. Improve the marketization system of rural land transfer in China through the above methods (Figure 2.11).

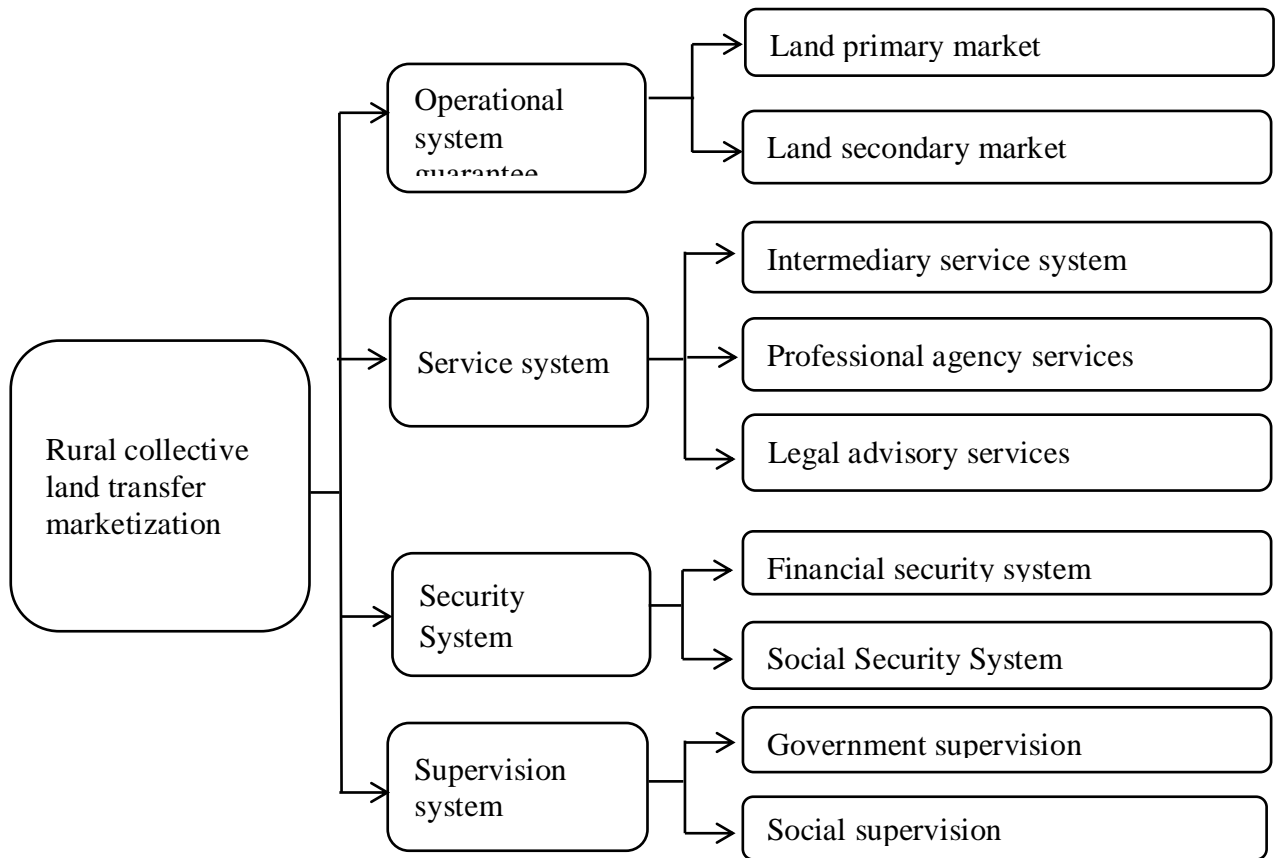


Figure 2.11 - Rural soil flow marketization system structure diagram

Data source: Literature collation and research induction

According to the above analysis, in the face of the new normal and new characteristics of China's economy, new situations and new requirements, it is imperative

to accelerate the construction of a large-scale operation system of family farmland transfer and promote China's agricultural development.

Accelerate the standardized and information-based management of land circulation. The government should strengthen the supervision of land transfer, enhance the management of rural land in the transfer of contractual management rights, and effectively protect the legitimate rights and interests of farmers from infringement. It is necessary to clearly define the functions of land use in the overall planning of county and township (town) land use, and use the land according to the specified purposes. At the same time, on the premise of maintaining the current stability of land contracting and land management unaffected, all localities should make scientific planning and rational layout of land use, carefully investigate the local rural contracting relationship, land contracting area, circulation time, circulation location, etc., and improve the issuance of rural land contract and contract management certificate according to law. We need to improve and standardize the registration system of rural land contractual management rights, accelerate the establishment of rural land contractual management right registration, certificate issuance, circulation and other rural land contractual transfer information systems, accelerate the establishment of a standardized and improved rural land transfer management system, strengthen the "one-stop" service management of land transfer management, improve the management service mode, and improve the service efficiency and scientific management level.

Promote land transfer according to law and relieve farmers' worries. In the process of land transfer, the government and relevant institutions should transfer the land legally according to the law, and the regulatory authorities should guide farmers to transfer the land orderly according to the law, and correctly treat and deal with the problems in the process of transfer. For example, the legalization construction of intermediary organizations, farmers' circulation subsidies and other issues must be urgently addressed by formulating relevant policies. At the same time, we should accelerate the promotion of rural social insurance, social relief, social welfare, preferential care and resettlement, mutual social assistance and rural cooperative medical care, establish and improve the social security fund system, social security fund for landless farmers, rural old-age

insurance, medical insurance and minimum living standard insurance, and other security network systems, effectively address the worries of farmers who have transferred land out of the country, so that land can better become the main source of protection for farmers' welfare, Promote the healthy and sustainable development of land transfer.

Strengthen the publicity of rural land transfer policies and regulations. Increase land flow in the whole society through various forms and channels

Change policy publicity efforts, improve government management departments, grassroots cadres, and farmers' awareness of the importance of accelerating land transfer, strengthen the study of policy and law related knowledge, and improve land development consulting services and management levels. We should fully understand the importance of land for farmers' employment and survival, and make it clear that land is the most effective means to increase farmers' income. Through the media and other channels, we should vigorously publicize the laws and regulations, preferential policies, rules and measures related to land circulation, create a good circulation development environment, so that farmers can eliminate the misunderstanding of rural land circulation and effectively invest in land circulation.

Establish and improve the financial service system of rural land transfer. Local governments should introduce relevant opinions and measures to speed up the transfer of rural land, and solve the difficulties in developing land intensification, scale and industrialization as soon as possible. Banks and other financial credit institutions should increase their support for loans to farmers with low income and high risk, establish and improve corresponding safeguard measures to share agricultural risks, and increase large-scale investment in land circulation and agriculture. We will innovate in the construction of the financial system, strengthen financial support, and effectively solve the shortage of funds for large-scale land contracting projects with long investment cycles and high risks. Establish and improve the insurance mechanism, reduce the risk of land transfer brought by farmers due to natural, market, and other reasons, and protect the vital interests of farmers. Strengthen the government's intervention and guidance in the market, and establish and improve the rural financial insurance mechanism. All regions should speed up the introduction of land use related policies, ensure that the channels for farmers to

apply for loans for land circulation and operation are unblocked, increase the investment of small loans for farmers to start businesses out of the land, and solve the problem of shortage of funds for starting businesses and employment.

Strengthen the information service construction of intermediary organizations. The intermediary organization of land consulting service is an independent economic entity whose behavior is subject to national laws, regulations, and relevant policies. Its function is to provide services such as land transfer information prediction, consultation, negotiation, transfer price evaluation, and carry out rural land financing, trust, insurance, investment promotion and other related activities. Strengthening and improving the construction of relevant rules and regulations of intermediary organizations and promoting the standardized and healthy development of intermediary organizations are important links to ensure that farmers have equal rights in land transfer and ensure the smooth and orderly development of land transfer. Intermediary organizations should actively guide farmers to carry out land transfer-related activities, so that farmers know about the tax and financial subsidies granted by the state and the government in the process of rural land transfer. According to the needs of land transfer market, intermediary organizations should define the content of service management and create a good development environment for rural land transfer. We will strengthen the construction of intermediary organizations' information networks and improve their business capabilities and information services. Strengthen the legal education, moral education and integrity education of intermediary organizations, ensure the transaction operation and market standardization of land transfer, and improve the service ability for farmers' land transfer. Intermediary organizations should strengthen the supervision and management of illegal circulation and post-circulation utilization, resolve conflicts and disputes in operation in a timely manner, and ensure that farmers achieve scale operation benefits. Intermediary organizations should strengthen the technical training, and vocational education of land-lost farmers in rural land transfer, effectively ensure that farmers can take up their jobs as soon as possible, improve the capacity building and service level of intermediary organizations, and create a good development environment for promoting large-scale land operation and agricultural modernization.

It is necessary to improve the corresponding market mechanism and related supporting facilities to increase the competition of land transfer in the market mechanism, promote the rational flow of rural land, and promote the smooth development of land transfer and marketization. At the same time, the government's macro-control should play a corresponding supporting role, but not too strong. It should give full play to the role of the market mechanism and improve the allocation efficiency. The government should establish and improve the rural social security system to solve farmers' worries. There is competition in the market mechanism, and the weak are eliminated. As the vulnerable subject in the process of land transfer, farmers should receive more education, training and benefit protection to better stand in the market mechanism of land transfer. We will create a good environment for large-scale land management, and promote the development of land transfer in the direction of scale and efficiency.

The issue of land transfer involves the vital interests of hundreds of millions of farmers across the country and the overall situation of social harmony and stability. We must fully understand the importance, complexity, and long-term nature of orderly transfer of rural land management rights and the development of appropriate-scale agricultural operations. Land system reform has always been a major measure to promote agricultural modernization and achieve balanced urban and rural development. Governments at all levels should actively take measures to accelerate the reform and exploration of the rural land contractual management right transfer system, innovate the new rural land management system, Create a good development environment for land transfer, create employment opportunities for farmers, achieve agricultural efficiency, increase farmers' income.

2.3 Economic component of the dynamic mechanism of family farm formation

The formation of family farms is the origin of today's society and the product of economic development. In recent years, the vigorous development of China's agriculture has promoted the continuous improvement of social and economic levels. China, as a

largely agricultural country, with the encouragement of various economies and policies, the management concept of family farms emerged at the historic moment, and quickly achieved comprehensive promotion. Henan Province, located in the central region of China, is a major agricultural province in China, which has played an important role in the process of agricultural development in China, because the economical components of the dynamic mechanism formed by family farms in various regions of China are roughly the same. The author of this section takes Henan Province as an example to study the economical components of the dynamic mechanism formed by family farms in China. By 2020, there were 36000 registered family farms in Henan Province, an increase of 18.5% over 2019. Family farms have provided important help for Rural Revitalization in Henan. Therefore, the development of family farms is particularly important in Henan Province. As a new type of agricultural management subject, the emergence of family farms has received extensive attention from the theoretical and academic circles. The development of family farms is a major strategic measure put forward in response to the strategic issues related to the future agricultural and economic and social development, such as the concurrent industrialization of agriculture, the hollowing out of rural areas, and the aging of farmers, under the background of the in-depth promotion of industrialization and urbanization. It is the focus of China's current agricultural policy.

According to the "report on the analysis of production and marketing of China's grain industry in 2021" released by the National Bureau of statistics, in recent years, China's grain planting area and output have been relatively stable. In 2020, the sown area of grain in China was 116768 thousand hectares, with a year-on-year increase of 0.6%; China's grain output was 669.49 million tons, up 0.9% year on year (Table 2.5)

Table 2.5 - Grain sown area and output in China from 2015 to 2020

Year	Planting Area (Unit.Thousand Hectares)	Grain Output (Unit.Thousand Tons)
2015	118963	660600
2016	119230	660440
2017	117989	661610
2018	117038	657890
2019	116064	663840
2020	116768	669490

Data Sources: <https://www.chyxx.com/industry/202107/965668.htm> [195]

Stable growth of grain output is the basis and guarantee of national food security. Henan is the core area of grain growth in China. In 2020, the grain planting area in Henan was 10,740 thousand hectares, up 0.04% year on year (Table 2.6).

Table 2.6 - Grain planting area and growth rate in Henan from 2015 to 2020.

Year	Planting Area(Unit: thousand hectares)	Growth
2015	11130	1.7%
2016	11220	0.8%
2017	10920	-2.7%
2018	10190	-0.6%
2019	10730	0.5%
2020	10740	0.1%

Data Sources: <https://www.chyxx.com/industry/202107/965668.html>[195]

In 2020, the wheat planting area in Henan province was 5,673.67 thousand hectares, down 0.6% year on year. In 2019, the corn planting area in Henan province was 3,801.33 thousand hectares, down 3% year on year. The grain planting area in Henan province was 10,193.87 thousand hectares, down 1.7% year on year (Table 2.7).

Table 2.7 - Main grain planting area in Henan Province from 2015 to 2020.

(Unit: thousand hectares)

Year	Wheat	Corn	Cereals
2015	5623.14	4189.91	10498.94
2016	5704.91	4210.46	10608.13
2017	5714.64	3998.94	10412.61
2018	5739.85	3918.96	10367.18
2019	5706.65	3801.33	10193.87
2020	5673.67	3789.21	10168.63

Data Sources: <https://www.chyxx.com/industry/202107/965668.html>[196]

Henan province is China's important grain production base, stable arable land resources have a certain reason. In 2021, the grain output of Henan province was 65.442 million tons (Table 2.8).

Table 2.8 - Grain output and growth rate in Henan from 2015 to 2021.(Unit: Thousand tons)

Year	Grain Output	Growth
1	2	3
2015	64702	5.5%
2016	64980	0.4%

Continuation of table 2.8

1	2	3
2017	65243	0.4%
2018	66489	1.9%
2019	66954	0.7%
2020	68258	1.9%
2021	65442	-4.1%

Data Sources:<https://baijiahao.baidu.com/s?id=1720266165585318279&wfr=spider&foc=pc> [197]

Among them, the summer grain output of Henan province in 2020 was 37.537,500 tons, up 0.2% yearly. The output of autumn grain in Henan was 30.720,500 million tons, up 4.1% yearly. Wheat output in Henan was 37.513 million tons, up 0.3 percent year on year (Table 2.9).

Table 2.9 - Main Grain Output of Henan Province from 2015 to 2020 (Unit: thousand tons)

Year	Summer crops	Autumn crops	Wheat	Corn
2015	35377	29325	35269	22885
2016	36283	28696	36186	22162
2017	37159	28087	37052	21701
2018	36137	30352	36028	23513
2019	37454	29499	37417	22473
2020	37537	30721	37531	22341

Data Sources:<https://baijiahao.baidu.com/s?id=1720266165585318279&wfr=spider&foc=pc> [197]

In 2020, the provincial GDP was 5499.707 billion yuan, an increase of 1.3% over the previous year at comparable prices. By industry, the added value of the primary industry was 535.374 billion yuan, an increase of 2.2%; The added value of the secondary industry was 2287.533 billion yuan, an increase of 0.7%; The added value of the tertiary industry was 2676.801 billion yuan, an increase of 1.6%. Agricultural growth was the largest. By 2020, Henan's total grain output accounted for nearly one-tenth of China's, and the total wheat output accounted for more than a quarter of the country. The output of peanuts and sesame ranked first in the country, and the output of vegetables and edible fungi ranked third in the country. As an important production and processing base of livestock products in China, Henan ranks among the top four in terms of cattle, pigs and

poultry raising, as well as poultry, eggs, meat and milk production. Henan has made great efforts to develop the processing and transformation of agricultural products, and has become the first major province of grain transformation, and processing, meat products and beef cattle in China. 50% of ham sausage, 33.4% of instant noodles, 25% of steamed bread, 60% of Tangyuan, and 70% of dumplings in the Chinese market are produced in Henan.

In addition to grain, in 2020, the annual output of poultry and eggs was 4.4942 million tons, an increase of 1.6% year-on-year; Milk output was 210.5 thousand tons, an increase of 2.9% year-on-year. The output of pork, cattle, sheep, and poultry was 5.3821 million tons, a year-on-year decrease of 2.8%; Among them, the output of poultry, beef, and mutton were 1.4805 million tons, 367.1 thousand tons, and 286.4 thousand tons respectively, an increase of 1.9%, 1.4% and 1.9% respectively. The output of pork was 3.248 million tons, a decrease of 5.7%. By the end of 2020, there were 38.8698 million pigs on hand, of which 4.0261 million were fertile sows, an increase of 22.6% and 33.7% respectively over the end of the previous year.

Up to now, the report on rural social and economic development in Henan Province 2020 released by the Henan Provincial Bureau of statistics shows that in 2020, rural industries in Henan Province developed steadily, the livable ecological index increased day by day, and the rural governance capacity continued to improve. In 2020, there were 130 thousand agricultural planting scale households and 91 thousand livestock and poultry breeding scale households in Henan, an increase of 7.1%, 10.8% and 20.2% respectively compared with 2019; The number of professional agricultural cooperatives reached 87000, and its members reached 1.611 million, an increase of 1.6% and 5.1% respectively compared with 2019. The number of agricultural enterprises in villages and towns reached 20 thousand, an increase of 3.8% compared with 2019. The proportion of administrative villages with e-commerce distribution stations also increased from 47.9% in 2019 to 64.4%. Rural small businesses and new rural industries are booming. In 2020, the number of supermarkets over 50 square meters in villages and towns reached 139 thousand, an increase of 9.7% compared with 2019. The number of households carrying out online sales of agricultural products reached 42000, and the number of households

carrying out leisure agriculture and rural tourism reached 18 thousand, an increase of 11.7% and 9.1% respectively compared with 2019.

In 2020, the per capita disposable income of rural residents in Henan Province was 16108 yuan, an increase of 6.2% compared with 2019. There are 5425 villages where rural residents receive benefits from village collectives, accounting for 12.0%, an increase of 1.9 percentage points compared with 2019; Among the village collective income, 13000 villages have operating income, accounting for 28.7%, an increase of 5.6 percentage points compared with 2019. In 2020, there were 1290 villages and towns with accommodation and catering enterprises in Henan Province, accounting for 71.5%, an increase of 1.2 percentage points compared with 2019; 1782 townships with industrial enterprises, accounting for 98.8%, the same as that in 2019.

According to the above data, Henan's agriculture has developed well, and family farms have played a very important role in the process of agricultural development. Looking at the history, family farms have roughly gone through three stages from germination to today:

In the stage of decentralized management, in the late 1970s, with the in-depth development of reform and opening up, the state made major adjustments in agricultural development, changing the original rural collective production to the household contract responsibility system, and advocating the development of individual subjective initiative. In the early stage, family farms were more independent production individuals, which played an important role in agricultural production at that time and promoted the development of local agriculture. On this basis, some farmers contracted more and more land, also known as family farms.

At the stage of legal circulation of land management rights, land circulation management in Henan Province developed at the beginning of the 20th century. The Department of agriculture of Henan Province issued relevant policies to encourage land circulation management. It is required that the main body of rural land transfer is farmers, and the contracted farmers decide whether to transfer the land and the object, method, time, and disposal of transfer income by themselves. At that time, the stipulated land circulation management methods were mainly exchange, subcontracting, transfer, lease,

shareholding, etc. Henan Province has always attached great importance to the legal circulation of land management, whether it changes the land ownership relationship through subcontracting, transfer, leasing, equity participation and other forms, or transfers by farmers themselves or rural collective organizations. According to the statistics of Henan Provincial Bureau of statistics, in 2010, the transferred land area of family farms in Henan province accounted for 6.7% of the total area of household contracted land. In 2015, the proportion was as high as 22.8%. By 2020, the ratio had increased to 42.6%. It can be seen from the data that the orderly and stable growth of land circulation has laid the foundation for the vigorous development of family farms in Henan Province.

After many efforts, agriculture moderate management of a new stage. In 2012, for the sustainable development of agriculture, Henan Province formulated the construction plan of the Central Plains Economic Zone, which clearly proposed that in the process of developing agriculture, we should not sacrifice the ecological environment, but take the path of sustainable development of modern agriculture. In 2020, the rural land circulation area in Henan Province reached 2.5487 million hectares, accounting for 69.3% of the household contracted cultivated land, of which 60% of the land went to large family farms, and 63.2% of large family farmers participated in the land circulation. In recent years, with the government's increasing support for agricultural development, the form of family farms has also improved. With the preferential treatment of loans, subsidies and other aspects, more and more land is transferred to collective economic organizations. Farmers hope to obtain greater benefits through collective benefits, so they expand their land area and enrich farm products.

According to the interview and survey, there are roughly three development modes of family farms in Henan Province from the perspective of specific development modes of family farms:

Family farms operate independently. This business model adopts the form of independent family farms. Its operation mode is that the labor force of the family farm is mainly family farmers, and the main source is agricultural income. This is a business model of making profits through large-scale agricultural production and management and marketization of agricultural and sideline products. This business model is still dominated

by family management. In the use of labor, production operators are mainly family members, and there are a small number of seasonal employees in busy farming seasons.

Among the many modes, Family farm + large enterprise business model. This business model adopts the mode of "order agriculture + industrialized production," takes advantage of the diversity, flexibility, and scale of family farm production, and combines the characteristics of enterprises in production capital, sales market, management, and innovative technology. Large enterprises often have strong comprehensive strength locally, and have formed a certain scale from product production, research and development to sales. Its operation mode is that family farms produce and plant according to the orders of large enterprises, which ensures that the things planted or produced by family farms have a way out for sale.

At the same time, there is a business model of family farm + professional cooperation. This new business model can enable family farms and professional cooperatives to achieve a mutually complementary, cooperative and win-win situation. They can not only give play to their respective characteristics, but also rely on each other to promote common development and realize resource sharing and information exchange while taking into account their respective interests. This mode of development plays an important role in farmers' income.

According to the institutional change theory of macroeconomics, The institutional change mechanism framework for the formation of family farms is constructed. Internal and external factors, external institutional environment and transaction costs restrict the formation process of family farms. The institutional change of Chinese family farms is a dynamic evolutionary process that combines the top-down design and promotion of the government and social elites, and the bottom-up pursuit of farmers, enterprises and other actors. In the process of the formation of the new system, the guidance of the national legal level and the determination of incentive rules and operating systems in economic activities are indispensable, and it is also the manifestation of farmers' subjective needs in the process of its formation (Figure 2.12). As a relatively efficient agricultural production situation in China at the present stage, family farms have a very important role and advantages in grain production and government regulation.

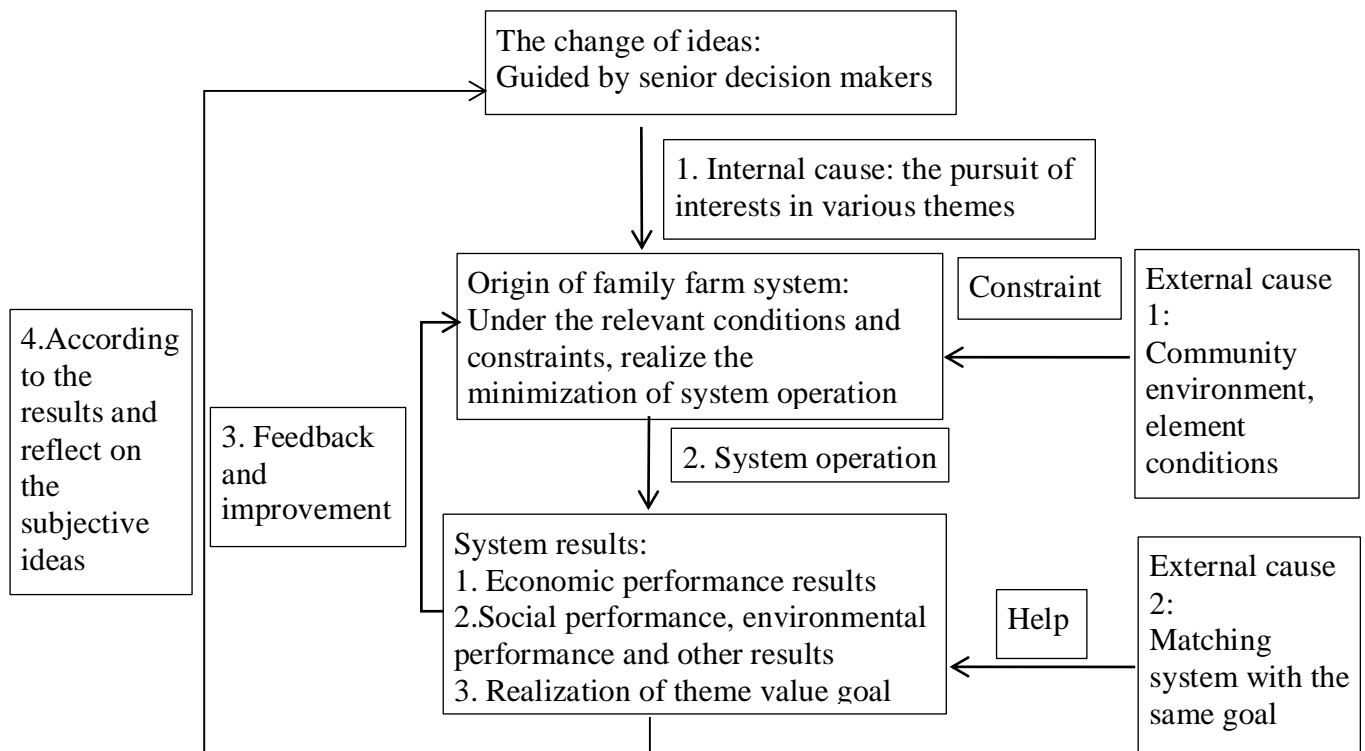


Figure 2.12 - The formation mechanism of the Chinese family farm

Data source: Literature collation and research induction

Since China proposed to develop family farms in 2008, the central government and local governments at all levels have issued a number of policy documents on the development of family farms and formulated a series of specific support measures (Table 2.10).

Table 2.10 - Support policies for family farms in major provinces or city

Province	Main policy measures
1	2
Hubei	We will improve rural economic management and service institutions, establish rural land transfer service centers, actively train farmers and provide special financial support.
Guangdong	Innovate commercial insurance, provide financial support and reward 100000 yuan for each demonstration farm. Improved The market for the transfer of rural land. The docking between farms and cooperatives will reach 80%.
Shandong	Increase financial support, establish 1406 land transfer service centers, train farmers in production skills, business ability and entrepreneurship, and establish a monitoring and management system for family farms.
Hebei	Establish a federation of demonstration family farms and provide special subsidies to eligible farms.
Hunan	Support with special funds, unify the identification and management of family farms, and encourage cooperation with agricultural technology departments and family farms
Heilongjiang	We will develop a family farm management system, formulate measures for the management of family farm identification, and implement financial subsidies.

Continuation of table 2.10

1	2
Jiangsu	Establish a family farm operation monitoring system, focus on supporting 6.67 hectares to 20 hectares farmers' family farms, focus on subsidizing the land transfer behavior of family farms, and train tens of thousands of farmers every year.
Jilin	Establish 881 land transfer service centers, 874 land transfer service halls and 10 million yuan of special funds to build a land market covering the province.
Anhui	With a special fund of 40 million yuan, we will carry out the identification of demonstration farms, with a subsidy of 50000 yuan for each, implement policy oriented agricultural insurance, 70% for government subsidies, 30% for farms, and training of farmers.
Henan	The special fund is 430 million yuan to support family farms and train more than 5000 farmers.
Zhejiang	Develop a unified circulation contract. the land circulation service organization shall be established in an all-round way, and the demonstration farm shall be established.
Sichuan	The policy guides to promote the cooperation and union of farmers, standardize the registration and guarantee the rights and interests of land circulation.
Jiangxi	We will strengthen policy guidance, improve the registration system, and set up special support funds.
Fujian	Provide 150 million yuan of special financial support each year, standardize land transfer and carry out demonstration construction.
Chongqing City	With 10 million yuan of funds, we will implement mortgage financing for rural property rights, develop agricultural insurance with 28 types of insurance and 10 billion insured amount, and promote the Internet + farms.
Liaoning	A family farm registration system will be implemented, and 50000 to 100000 yuan will be awarded to the identified demonstration farms.
Tianjin City	Set up 131 land transfer service, forming a land transfer service system and the government established Agricultural Investment Guarantee Co.Ltd.
Shanxi	Establish the family farm directory, develop the family farm information management system, and establish the family farm file:
Inner Mongolia	We will introduce standards for the identification of family farms and pastures, and standards for the construction of ecological family farms and pastures.

Data source: Literature collation and research induction

Through administrative regulation, the government exerts power on the establishment and operation of family farm organizations, defines the nature and business scope of family farms, further clarifies the property rights of family farms, provides a stable environment for actors actively participating in family farms, and effectively promotes the proliferation of family farms.

At the same time, economic factors have also become an important factor in the formation of family farms, which is essential among the driving factors of the formation of family farms.

For a long time, China had a large population and less land, which makes the scale of agricultural operations small and the per capita output small. According to the relevant data of the Ministry of agriculture and rural areas, at present, the per capita cultivated land of Chinese farmers is about 0.09 hectares, and the average household is generally less than 0.67 hectares, which is distributed in different plots. Therefore, the business scale of an ordinary farmer is about 0.27 hectares (a family of 3 people) to 0.47 hectares (a family of 5 people). Even assuming that a family has ten people's cultivated land, according to the principle of average distribution, the family has at most 0.87 hectares of land. If the average annual net income per hectare is 10500 yuan, the annual agricultural income of a family of ten people is less than 10000 yuan, and the per capita income is less than 1000 yuan. Therefore, the too small-scale of agricultural operation will inevitably make the operating ability of agricultural workers unable to be fully exerted, and there is no way to talk about scale benefits. Through land circulation, the cultivated land can be moderately concentrated to farmers and families who are willing to produce agriculture, which is conducive to giving play to the intensive advantage and realizing economies of scale; At the same time, the continuous concentration of cultivated land also makes it possible to popularize improved varieties, apply agricultural technology and mechanized operation, so as to speed up the process of agricultural modernization.

When a new economic component arrangement is in line with the current reality, farmers will be more motivated to choose a new one (Figure 2.13). Q1 represents China's traditional small-scale farmers' operation stage, with small scale, self-sufficiency, low commodity rate, fewer farmers' active participation in market transactions, and low transaction costs. At the same time, labor production efficiency is extremely low, scale is uneconomical, and production costs are relatively high; With the deepening of the division of labor, many young and middle-aged labor forces are separated from agricultural production, agricultural land is relatively concentrated, and the operation scale of farmers has reached Q2. Due to the expansion of production scale, various factors have been more fully utilized, and labor productivity has increased, resulting in the decline of production costs. At the same time, the expansion of scale makes operators pay more attention to the collection of market information, increases the number of active

participants in market transactions, and transaction costs are bound to rise. The optimal production scale, Q2, is reached when the marginal savings in one cost (production cost) equals the marginal increase in another cost (transaction cost). To further pursue the trading benefits brought by the advantage of scale, farmers internalize external transactions through "vertical" or "horizontal" cooperation, further reducing transaction costs. Farmers push the production scale to a higher level of equilibrium, namely Q3, but the larger the scale is not the better. When the business scale exceeds the carrying capacity of family members, it will bring about a substantial increase in management costs and employee supervision costs. Therefore, the family farm with an appropriate scale is the choice for farmers with comparative advantages.

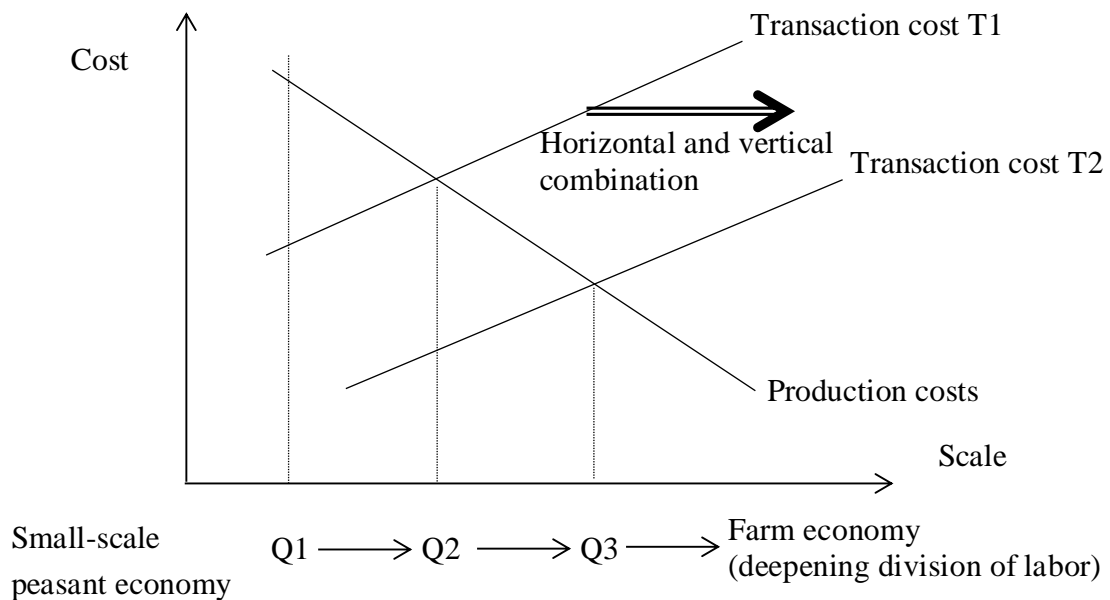


Figure 2.13 - The trend of the transition from a small-scale peasant economy to farm economy

The pursuit of various entities to save transaction costs and the external economy is also the pursuit of saving transaction costs and external economy in essence. Specialized family farms largely avoid the shortage of small-scale farmers' operations, and can reduce the transaction costs brought by the government's support for agricultural policies. Family farms will promote standardized development and reduce operating costs. At the same time, the reform of the mainstream ideology and the government's policy

guidance. Behind the economic and social changes is the evolution of people's thinking habits. The essence of Chinese family farms is a set of reengineering rules for agricultural management organizations. In 2009, the total amount of four agricultural subsidies reached 127.5 billion yuan; In 2016, the total amount of four agricultural subsidies reached 167.99 billion yuan, an increase of 31.8% over 2009; By 2020, the national agricultural general public budget expenditure will reach 704.037 billion yuan. Meanwhile, in 2010, the area of farmland transferred accounted for 14.7% of the area of household-contracted farmland. In order to encourage land transfer, the central government again emphasized the formation of a land transfer pattern in 2014, and the area of transferred cultivated land in that year reached 30.4%. Increase by 4.3% in 2020 compared with 2019.

Before 1985, China implemented a system of unified purchase and marketing, which severely hindered the free circulation of grain. By 1985, explicitly abolish the unified purchasing and marketing system, and the rural commodity economy had achieved initial development. Since then, China's grain price has gradually realized the full liberalization of the price of agricultural products, providing market conditions for the emergence of family farms, and farmers began to explore land scale management. In recent years, the prices of major agricultural production factors in China have risen across the board, pushing agricultural production into a high-cost era. According to statistics (Figure 2.14), since 2003, the production cost per hectare of wheat, corn and rice has been increasing, especially since 2009. The soaring agricultural production costs have lowered the profit space of farmers, further aggravated the differentiation and transfer of farmers, and promoted the transformation of part-time agricultural farmers to new business entities such as family farms.

Changes in the social environment. The household registration system is loose. At the beginning of the reform and opening, the state prohibited farmers from working freely in cities. At that time, more than 800 million farmers were tied to 9.6 million square kilometers of land, and the relationship between people and land was very tense. At the end of 1986, the number of people who handled the "self-food ration household registration" nationwide was about 4.543 million.

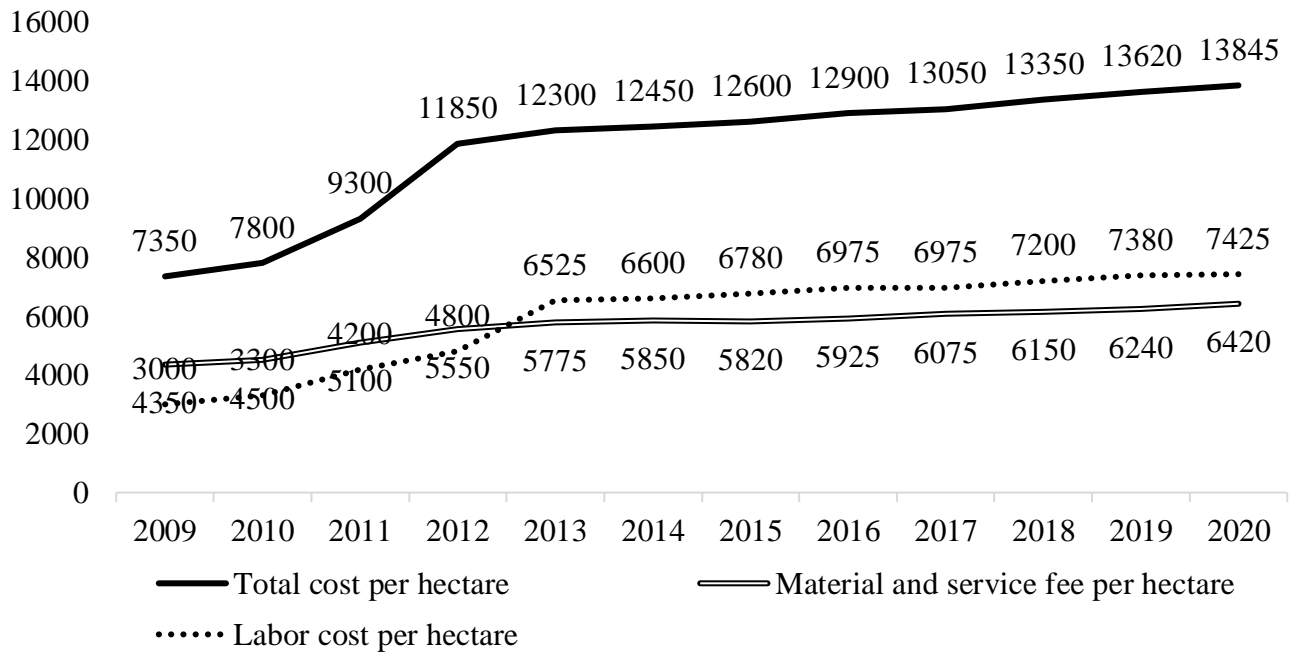


Figure 2.14 - Production cost of grain crops in China. (unit:hectare)

Data source: Data receipt and calculation

In 1990, 53.17 million people in the country realized the transformation from agricultural household registration to a non-agricultural household registration. In the process of urbanization, China's urbanization level has increased from 46.59% in 2009 to 63.9% in 2020. Urbanization is the inevitable result of industrialization development to a certain stage. Industrialization affects urbanization by stimulating employment, increasing income, and changing landform. Cities are the best carrier for industrial development. Industrialization is the economic connotation of urbanization, and urbanization is the spatial manifestation of industrialization. The two promote each other. Nowadays, the constant penetration of industrialization in all aspects of agricultural production, such as the massive use of efficient pesticides and fertilizers and the introduction of agricultural mechanization equipment, has led to the improvement of agricultural productivity and the continuous decline of labor input and labor intensity per unit area, resulting in surplus agricultural labor. The surplus agricultural labor urgently needs to find new employment opportunities.

At the same time, in the process of industrialization and urbanization, various factors are indispensable, especially the infrastructure construction will require a lot of

workforce. With the gradual opening of the household registration system, population mobility and migration have become possible.

Table 2.11 - China's urbanization in 2009-2020. (unit: Ten thousand people)

Year	Total Population	Urban Population	New Urban Population	Urbanization Rate	Growth Rate
2009	133450	62174.36	1214.40	46.59	0.91
2010	134091	63693.23	982.73	45.68	0.74
2011	134735	69078.63	5079.51	51.27	3.77
2012	135404	71181.88	1760.25	52.57	1.3
2013	136072	73070.66	1537.61	53.7	1.13
2014	136782	74915.50	1463.57	54.77	1.07
2015	137462	77116.18	1828.24	56.1	1.33
2016	138271	79298.42	1728.39	57.35	1.25
2017	139008	81347.48	1626.39	58.52	1.17
2018	139539	83137.69	1790.21	59.58	1.06
2019	140005	84843.26	1705.57	60.6	1.02
2020	141268	90270.25	5426.99	63.9	3.3

Data source: Data receipt and calculation

Many agricultural populations enter cities in the process of urbanization and industrialization to seek development. Urban employment and agricultural labor face different reward incentives. The income of urban workers is far higher than that of rural workers, This obvious difference in economic incentives has formed a strong attraction for agricultural labor, and the surplus agricultural labor also has employment channels. The impetus given by industrialization and urbanization to agriculture will objectively "squeeze" a large number of rural surplus labor out of agriculture, leaving them temporarily, for a long time or even forever from their farmland, which provides an important prerequisite for the transfer and concentration of agricultural land and large-scale operation.

In 1986, the state encouraged "the gradual concentration of land to skilled farmers", and some economically developed regions began to explore large-scale land management. After 2017, the national agricultural production trusteeship service developed rapidly. Taking Zhongxiang City, Hubei Province as an example, from 2017 to 2019, developed 368 agricultural trusteeship service organizations, and Provide agricultural production trusteeship service 18,500. At the national level, by the end of 2019, there were more than 440 thousand "agricultural production trusteeship" service organizations nationwide,

benefiting 25.82 million households directly. Many local governments or village collectives have creatively invented "rural land banks", "land cooperatives" and other transfer platforms to regulate and guide rational transfer and concentration of rural land, thus creating conditions for the formation and operation of agriculture.

In addition, China's rural cooperative medical system has been fully covered, the operation of the endowment insurance system has become increasingly perfect, farmers' dependence on land has gradually weakened, and the financial service system is also helping Chinese family farms to solve economic difficulties. These constantly changing environmental conditions express a strong demand for new institutional arrangements. Under the conditions of increasingly mature social, economic and technological conditions, with the continuous opening of the rural production factor market and the growing development of agricultural productive service organizations, China's family farms have gradually differentiated from traditional farmers and become the leading economic subject of modern agricultural production and operation, and will also contribute a strong force to China's agricultural industry in the future.

Conclusions to section 2

The second section analyzes and studies the organization and economic principles of family farm development and management, and analyzes the organization and financial aspects of family farmland use from the perspective of family farm informatization, so that land can better serve agriculture. At the same time, the dynamic mechanism of the formation of family farms is analyzed, and the economic components of the formation mechanism of family farms are discussed to provide a basis and reference for better management development. Through the second part of the research, the following conclusions are drawn:

1. By the end of 2020, the broadband penetration rate in China's rural areas has almost reached 100 percent, and the number of rural broadband users has exceeded 100 million. Based on the comprehensive calculation of the relevant data of 2,642 counties (cities and districts) in China, the overall development level of agricultural and rural

informatization in counties nationwide reached 37.9%, the online retail sales of farm products in counties accounted for 13.8% of the total sales of farm products, the coverage rate of e-commerce service stations in administrative villages reached 78.9%, and the coverage rate of county-level agricultural and rural informatization management service institutions was 78.0%. Informatization as a whole tends to rise.

2. The practical significance of the family farm information management system is determined. Currently, the development of family farm informatization in China is in the initial stage, and the utilization rate of family farms to agricultural information platforms is low. 45.78% of the operators use the service provided by the rural Information society less than ten times a year. 41.18% of operators use the services provided by the 12316 platform less than ten times a year. At the same time, the family farm information infrastructure is not perfect, the laws and regulations are not perfect, the conversion rate of information technology achievements is not high, the family farm information talent is scarce, the information service subject power is insufficient and so on.

3. The information needs of family farms are diversified. Different types of family farms have different information types, and their information needs are highly related to their business characteristics. Family farm operators prefer to use mobile phones and the Internet to access agricultural information. Modern information dissemination channels contain more and better information resources. However, the application level of these information circulation channels in family farms is still low, and there is a disconnect between the actual information obtained and the demand.

4. According to research and calculation, the top 10 provinces (cities) with a large proportion of cultivated land transfer area in the contracted developed land area are as follows: Shanghai 60%, Beijing 48%, Jiangsu 43%, Zhejiang 42.3%, Chongqing 40.2%, Heilongjiang 32%, Guangdong 27.8%, Hunan 24%, Henan 23%, Fujian 21.2%. The ten provinces (regions) with a more significant increase in circulation area than the previous year are Gansu 89%, Henan 52%, Shanxi 51.1%, Hebei 47%, Ningxia 43.3%, Liaoning 41.1%, Hubei 37%, Guizhou 31.2%, Shandong 29.3%, Anhui 28.8%. It can be seen that according to the total area of household contracted farmland transfer in China by province, the distribution of different regions is very uneven.

5. The land is the basis of the family farm, because our country people, the lack of land is an important factor in the management of family farm development in our country, land circulation for the family farms is important to realize the large-scale, intensive, under the environment of market development, family farmland circulation has not merged with today's market mechanism, through the implementation of the land market mechanism, It can avoid the waste of land resources caused by the conservative ideology of farmers and other factors. It can make the land transfer form its own marketization mechanism, bring security to the land transfer of family farms, improve production efficiency, and improve the development level of family farms.

6. The generation of family farms mainly benefits from two internal and two external causes. The internal factors include the peasant household's acquisition of free control of land and labor force and the pursuit of scale economy, and other subjects' pursuit of saving transaction costs and external economy. The two internal factors are essentially economic incentives. External causes include the change of leading social thought and government policy guidance, the development of the commodity economy and the change in the social environment. The two external causes are essentially social incentives. With its development, three modes have emerged, namely, independent management mode of family farm, management mode of family farm + large enterprises, and management mode of family farm + professional cooperation.

7. According to the institutional change theory of macroeconomics, to construct the reform mechanism framework of family farm system. The development of family farms is constrained by internal and external factors. Institutional change in China's family farm is from the government, the social elite top-down design and promotion, such as the pursuit of actors from bottom to the top of peasant households and enterprises combining the dynamic evolution process of the new system in the process of formation, state law guide and determine the economic activities of incentive rules and operation system is indispensable, In its formation process is also the performance of the subjective needs of farmers.

8. According to the analysis, Chinese family farm has experienced three stages of development from its formation to the present: In the decentralized management stage,

the transfer stage of land management rights according to law, and the new stage of moderate-scale agricultural operation, in 2010, the transfer land area of family farms in Henan Province accounted for 6.7% of the total land contracted by families, and in 2015, the proportion was as high as 22.8%, and in 2020, the proportion increased to 42.6%. The rural land transfer area reached 2.5487 million hectares. We will innovate land transfer carriers and implement a new land joint-stock cooperative system. Speed up the standardization and information management of land transfer, promote land transfer according to law, relieve farmers' worries, strengthen the publicity of rural land transfer policies and regulations, strengthen the information service construction of intermediary organizations, and increase the participation of land transfer in market mechanism competition, so as to provide a basis for the formation of agricultural farm land in China.

SECTION 3

TOOLS OF FAMILY FARM MANAGEMENT SYSTEM

3.1 Management of comprehensive quality training family farmers

In the development of modern agriculture, farmers play a key role, especially the new professional farmers who can better reflect their yearning for modern agriculture and accelerate the process of agricultural modernization. In recent years, the education and training of new-type professional farmers have developed rapidly. Under the background of accelerating agricultural modernization, family farmers, as representatives of new-type professional farmers, cultivate a group of family farmers who are literate, skilled, and good at management and management. Joining family farm management is related to the realization of family farmers' professional development. Rural human resource management is an important aspect of the management process of improving the development of family farms. At the same time, it is also the key to the upgrading of human resource management and the two-way flow of urban and rural resource elements, according to section 2.1. In the analysis of management factors affecting the development of family farms, It can be seen that family farmers play a very important role in the management of the development of family farms. As a typical representative of new professional farmers, family farms belong to an important part of human resource management. Improving of the comprehensive quality of modern agricultural management of family farmers plays a vital role in improving the management process of family farm development.

To better understand the family farmers in the new family farmer training, the family farmer training system is understood and analyzed by issuing network questionnaires and field visits (Appendix C). As follows:

Table. 3.1 - Basic information about the investigated farmers

Investigation items	Content	Sample number	Proportion
1	2	3	4
Gender	male	151	81.6
	Female	34	18.4

Continuation of table 3.1

1	2	3	4
Age	Under 30 years old	18	9.7
	31-40 years old	36	19.4
	41 to - 50 years old	41	22.2
	51-60 years old	55	29.7
	Over 61 years old	35	18.9
Education level	primary school and below	66	35.7
	Junior high school	58	31.3
	Technical secondary school or senior high school	41	22.2
	Junior college or above	20	10.8
Number of family	1	9	4.9
	2	17	9.2
	3	33	17.8
	4	41	22.1
	5	51	27.6
	6	27	14.5
	7	7	3.9
Establishment period (year)	1	28	15.1
	2	36	19.5
	3	43	23.2
	4	26	14.1
	More than 5 years	52	28.1

Data source: Data investigation and arrangement

According to the survey, from the survey results of the overall effect of modern agricultural management education and training, most farmers are relatively satisfied with the current training effect, and only 20% of farmers say that the training they have participated in has a general or no effect on the development of their industry. They generally put forward their views on the issue of training time. 50% of family farmers think that the training time currently organized is too short, which reduces the training effect to a certain extent. 36% of the farmers said that the training time was not arranged reasonably, which sometimes conflicts with their production and operation time. Once there is conflict, the proportion of people who give up training is as high as 65%. The selection of training location, training personnel and training content is also an important factor affecting the training effect. 23% of family farmers said that the current training content did not meet their actual needs. 19% of the respondents pointed out that

inconvenient transportation is the problem of some of the current training. In fact, the accessibility of transportation will have a direct impact on the participation rate of family farmer training. The number of people who think that there are problems such as "outdated content" and "teachers' lectures is not vivid" in the current training is relatively small, accounting for 14% and 5% respectively. In addition, less practical operation, fewer visits and learning, and less independent learning content are also one of the reasons for reducing the effect of modern agricultural management comprehensive quality training for new family farmers (Figure 3.1).

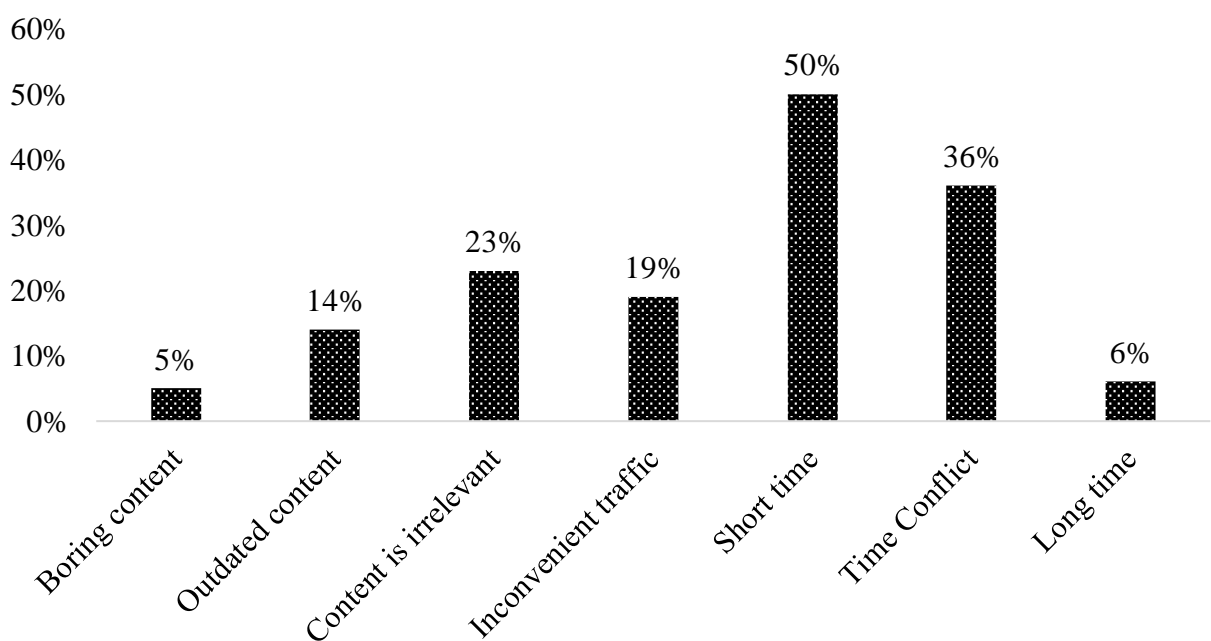


Figure 3.1 - Factors Affecting the Training Effect of Family Farmers

Data source: Data investigation and arrangement

Demand analysis on training duration. The survey results show that the single training time is too long or too short, which is not the best choice for farmers. The duration is too short to enable farmers to really learn and absorb the training content, and the training effect is poor. Too long will delay the agricultural time and reduce the enthusiasm of trainees. Only 6% and 3% of farmers are willing to participate in one day and more than 11 days of training, and up to 82% of farmers are most willing to accept one-time continuous training for 3-7 days. Generally, the training will not last more than ten days, mainly for two reasons. First, the farmer's own quality is not high, the learning ability is

limited, the learning ability is general, and the self-control is low. If the one-time training period is long, it is easy to reduce their curiosity and the favorable degree to the training and reduce the possibility of participating in the training again. Second, only by controlling the duration of one-time training can the possibility of conflict with farmers' production and operation be reduced and the training participation rate is improved (Figure. 3.2).

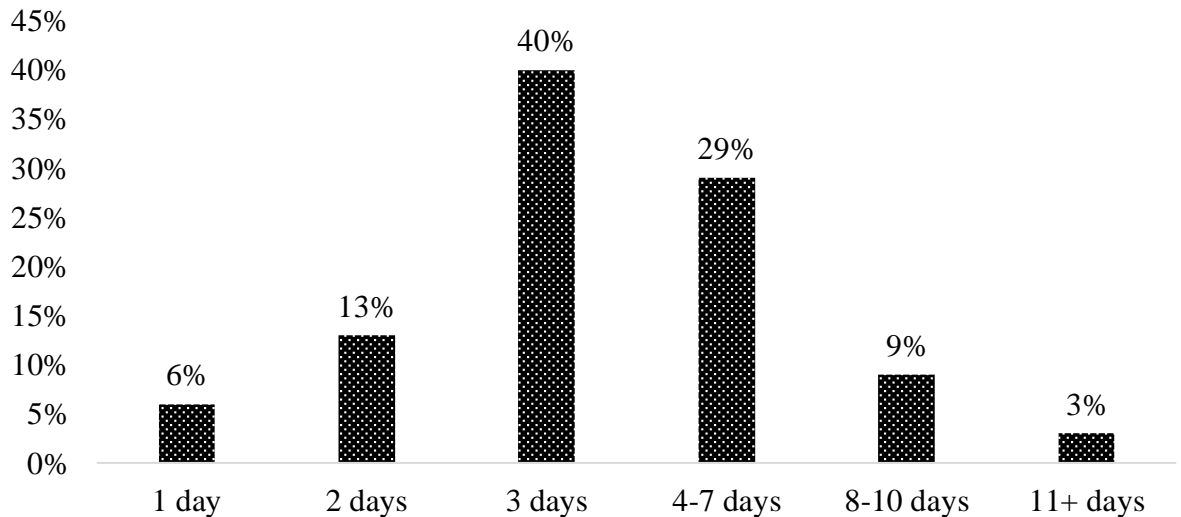


Figure 3.2 - Training time preferred by family farmers

Data source: Data investigation and arrangement

From the expected results of the training sessions, it is not that the higher the training frequency, the better the training effect, and the high-frequency training will even have a negative impact. The survey results show that family farmers are most willing to receive 5-6 training sessions in a year, followed by 3-4 training sessions, accounting for 49% and 41% respectively.

Demand analysis of training places. According to the survey results (Figure 3.3), the most willing and second-willing training places for farmers are County towns and large cities. The distance from home is an important factor affecting their choice. If the distance is too short, it will reduce the farmers' awareness of the value of this training, and it will be isn't easy to stimulate their willingness to participate in the training. The results show that only 5% of the respondents will give priority to training in their own villages, and 18% will choose to receive training in their own towns. As the distance from

home becomes longer, the problem of inconvenient transportation will become more and more obvious, resulting in additional time costs and transportation costs, which will become a factor that hinders farmers from participating in training. Therefore, it is more appropriate to choose a training place that is moderate or slightly away from home. The results showed that 29% were more willing to participate in education and training in counties with moderate distance from home. However, 22% of the farmers said that if could provide transportation services, they would also like to go to large cities far away to participate in education and training. It can be seen that farmers do not exclude or even yearn to participate in the training in big cities. Instead, it can become a factor in attracting farmers to participate in the training. The convenience of transportation is the key factor affecting the choice of farmers. Free transportation service is conducive to further improving the participation rate in training.

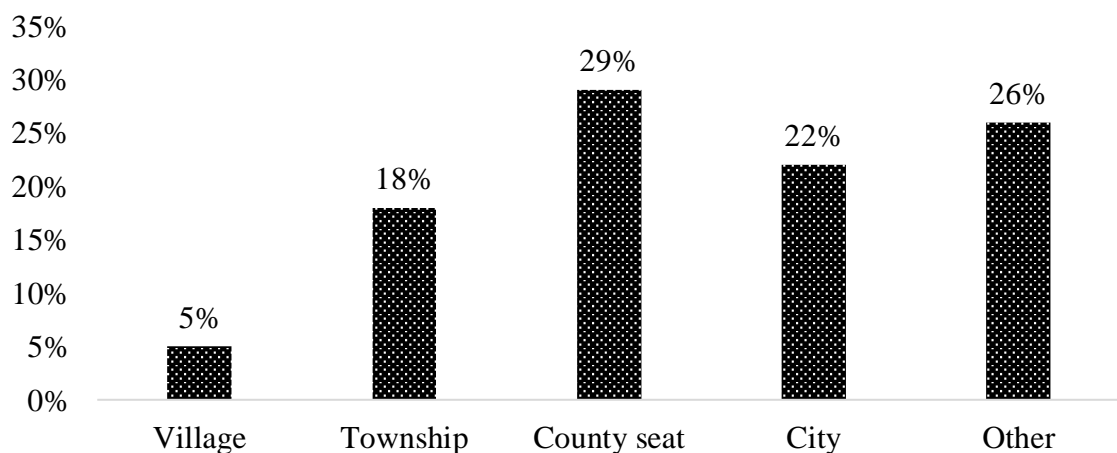


Figure 3.3 - Training locations for family farmers

Data source: Data investigation and arrangement

Demand analysis for trainers. The survey results show (Figure 3.4) that family farmers do not have much demand for the teaching skills of the trainers, but attach great importance to their professionalism. Only 6% of family farmers said that they would refuse to participate in education and training because the teacher's lectures were not attractive. They believe that the professionalism of training teachers will affect the quality and value of training. They are more willing to trust experts than ordinary teachers. The results show that 65% of farmers like senior experts or professors to teach because they

come from scientific research institutions or major universities and have a high degree of specialization and certain authority in their fields. As a result, agricultural broadcasting schools, agricultural technical extension departments, and agricultural vocational schools are more convenient for family farmers to train.

The training teachers more popular than experts are county and township agricultural technicians. Up to 79% of farmers are willing to participate in the training taught by county and township agricultural technicians. Because the family farmers who attend the training believe that the quality and professionalism of agricultural technicians in counties and towns is relatively high. In addition to having theoretical knowledge, they are also close to the production line and have a lot of reliable, practical experience. For most farmers, the skills training tested in practice is more convincing and attractive. The number of farmers who like rural experts, local experts, and experts from government departments is not different, accounting for 45% and 40% respectively. Farmers said that they like the training provided by government departments because they think that this channel can help them more efficiently and conveniently obtain policy support, science and technology and other information services. Generally speaking, the farmers' favorite trainers are in turn, the agricultural technicians of grass-roots counties and townships, experts or professors of scientific research units or universities, rural experts or local experts, and government personnel. When they receive education and training, they have higher requirements for the professionalism of the teachers, but in contrast, they prefer "theory + practice" type trainers.

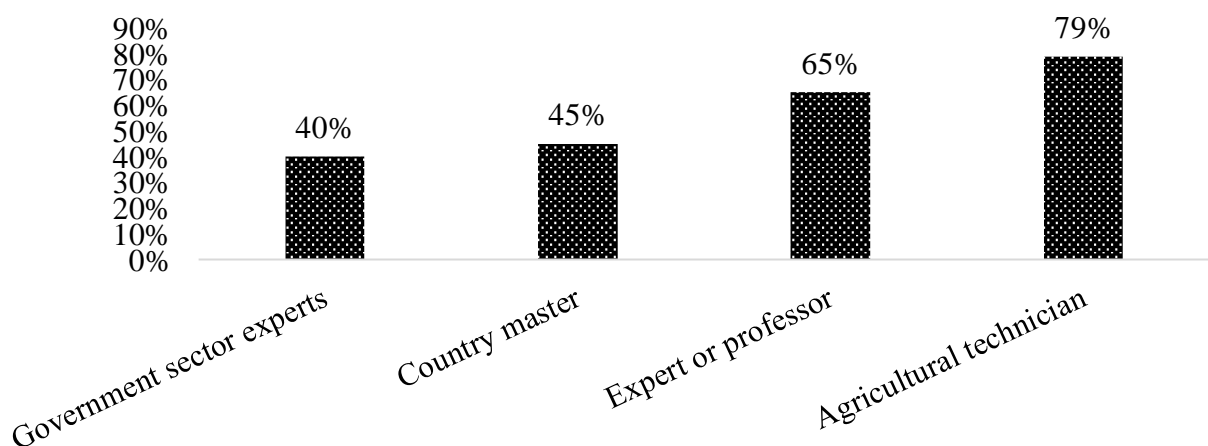


Figure 3.4 - Trainers preferred by family farmers

Data source: Data investigation and arrangement

Demand analysis of training type. The survey results show (Figure 3.5) that 98% of family farmers have participated in some vocational education and training, and there are significant differences in the needs of farmers for training types. At present, the types of vocational education and training for family farmers can be divided into nine types, namely, practical technology training, vocational skills training, agricultural products e-commerce training, new agricultural business leaders training, modern young family farmers training, agricultural comprehensive management training, agricultural products processing and marketing, entrepreneurship training and academic education. In the sample, the number of farm owners who have participated in vocational skills training and practical technology training is the largest, accounting for more than 70%. Because they think that they can learn real skills from such training, and the conversion rate of training value is relatively high. 50% of the farmers, as leaders of family farms, have participated in the training of leaders of new agricultural business entities.

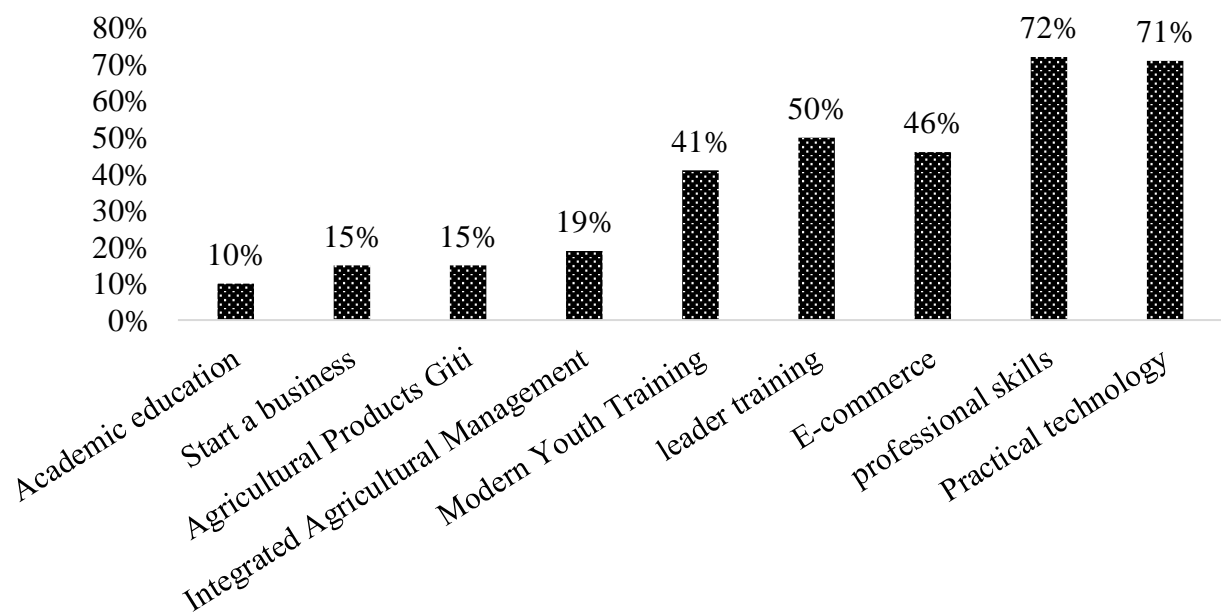


Figure 3.5 - Types of training preferred by family farmers

Data source: Data investigation and arrangement

On the demand analysis of training forms, farmers have a greater demand for offline training. About 25% of farmers have a demand for online training (distance learning) and training forms combining online and offline. However, this article believes that this does not mean that farmers need little to participate in online training. Because

most of the farms that farmers have participated in are mainly offline, they lack awareness of online training. Therefore, it is not that they really do not need online training, but that they have not realized the convenience of online training. During the survey, most farmers said that there were two main reasons why they did not participate in online training. First, the information was not obtained in a timely manner, and they did not know the relevant notice of online training at the first time for each client. Second, due to the limitations of equipment or other technologies, many middle-aged and old farmers cannot skillfully operate smartphones, computers, and other teaching equipment.

In the form of learning. There are 86% of farmers are most willing to participate in face-to-face teaching, which is the fastest and most effective training form for farmers to learn new knowledge, with high efficiency and low cost the others accounted for 62%, 58%, and 24% respectively. The learning effect of field teaching is easily affected by weather, location, a number of trainees, and other factors, and the training time cannot be guaranteed. The two training forms of field practice and visit and investigation are relatively practical, and the classroom is relatively dynamic and attractive, which meets the training needs of farmers. In the survey, 37% of the interviewees think that the training and learning in the current the visits form are too few. They hope to expand their own vision of agricultural development and learn from the successful experience of others through visiting good production and business individuals.

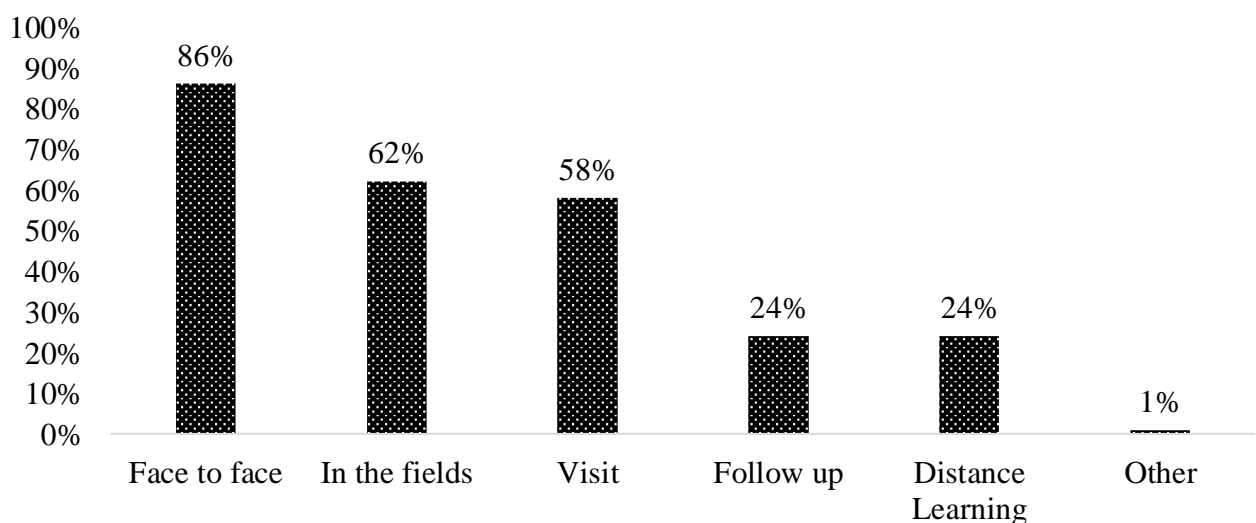


Figure 3.6 - Forms of training preferred by family farmers

Data source: Data investigation and arrangement

Demand analysis of training contents. First, from the perspective of motivation, "improving production and operation skills" is the primary goal of almost every participant participating in the training, followed by "obtaining information" and "obtaining policy support, " accounting for 70% and 53% respectively. Secondly, many farmers believe that the current lack of government policies, funds, professional and technical knowledge, and marketing training has led to the lagging development of family farm production and operation.

Therefore, from their view of the constraints of family farms, the current demand of Chinese family farmers for training content is mainly reflected in professional technical training and information training covering policies, and markets. According to the analysis of the survey result entitled "what is the training content you need most" (Figure 3.7), farmers have the least training demand for employment and entrepreneurship skills, accounting for about 30%. Farmers who expected to participate in practical skills training were the most, accounting for 93%, up 60% compared with employment and entrepreneurship skills training. In their view, solid and stable practical production and management technology is the necessary condition to ensure the high-quality development of the farm, and it is also the training content they most need at present, involving the planting, aquaculture, fishery, and other industries.

In addition, the products of all industries need to circulate in the market. 65% of family farmers would like to participate in agricultural marketing training to help them obtain timely market information and seek more efficient and convenient product sales. The training needs of the industrial situations and relevant policies, business management, and legal knowledge are general, accounting for about 40%.

In a comprehensive view, the contents of education and training most needed by family farmers are practical agricultural technology, agricultural product market information, marketing, industrial situation and related policy training, business management and legal knowledge, agricultural product processing, storage and transportation service technology, and employment and entrepreneurship skills training.

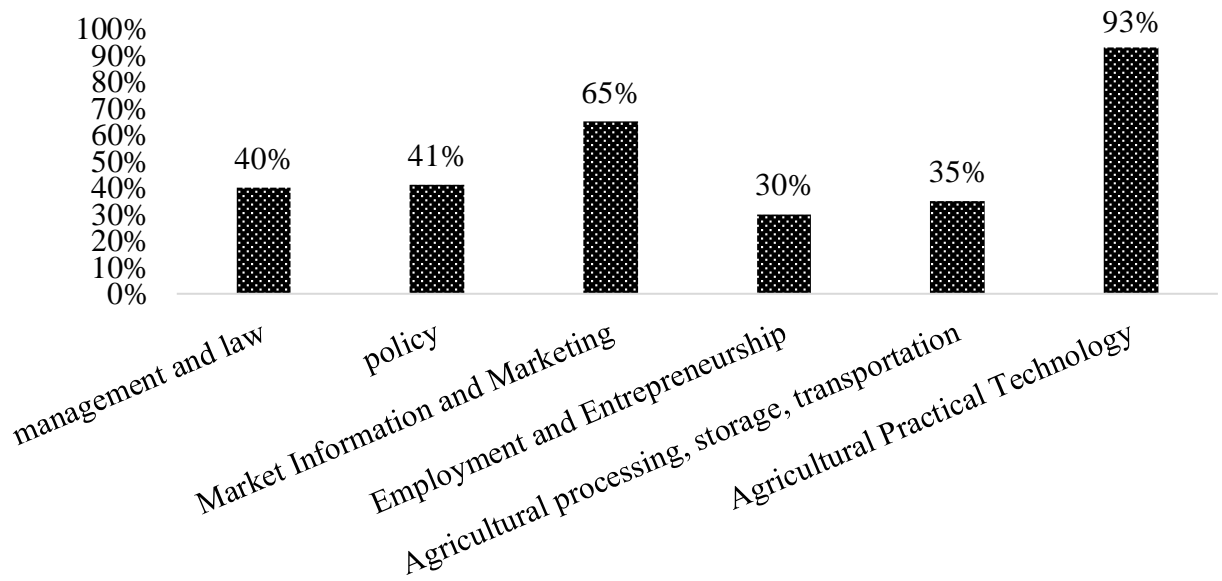


Figure 3.7 - Training content preferred by family farmers

Data source: Data investigation and arrangement

According to the above survey results, there are mainly the following problems in the comprehensive quality training of modern agricultural management for new family farmers.

Table 3.2 - Problems and solutions of modern management training for new family farmers

Current problems	Solutions and tools
Young talent resources are particularly scarce, and the awareness of actively participating in education and training is weak	Strengthen the team of young farmers, improve the overall sense of participation, adopt incentive mechanisms, and encourage young farmers to start their own businesses
The form of vocational training for family farmers is single	Improve the diversity of education and training forms and strengthen innovation
The content of education and training lacks timeliness and pertinence, and the efficiency of information circulation is low	Give full play to the advantages of online and offline, and strengthen the co promotion of two lines
The support objects are not specific and comprehensive enough	Strengthen the continuous innovation of offline teaching forms
Lack of supervision and assessment mechanism	Strengthen the communication between farmers and education and training organizations, standardize the management information flow process

Data source: Data investigation and arrangement

In view of the above survey results and the analysis of the causes of the problems in the modern agricultural management training of new family farmers, this paper puts

forward suggestions to promote the development of modern agricultural management education and training of new family farmers, to provide a reference for the improvement of the comprehensive management quality of new family farmers.

Establish a modern agricultural management training platform for new family farmers in conjunction with agricultural colleges, scientific research institutions, education and training institutions, agricultural extension stations, agricultural enterprises, and other organizations, and allow organizations with education and training qualifications and functions to participate in the education of new family farmers. In terms of teaching, should carry out the education and training of new family farmers according to the actual needs of local farmers in agricultural production, gradually develop toward specialization and hierarchy. In the education and training of new-type family farmers, strengthen the combination of theoretical knowledge and agricultural practice. Through legislative support, we will ensure the legalization, standardization and high efficiency of the education and training of new family farmers, establish a long-term mechanism for education and training, ensure that high-quality agricultural talents for the development of modern agriculture are continuously imported into the main team of new family farmers, and build a new family farmer education framework (Appendix D).

We will strengthen the ranks of young farmers and improve their overall sense of participation. In order to further promote the high-quality development of family farms, we must deeply implement the "modern young farmer plan" and continue to devote ourselves to the work of reserving young agricultural talents. At the same time, it is necessary to strengthen publicity, help farmers cultivate entrepreneurial confidence and competitiveness, and create a good learning atmosphere to promote a comprehensive understanding of new things. Adopt an incentive mechanisms to create a good learning atmosphere.

Improve the diversity of education and training forms and strengthen innovation. A single form of education and training is easy to reduce the enthusiasm and enthusiasm of family farmers, thus reducing the effect of education and training. Therefore, in order to improve the quality and efficiency of education and training for new family farmers, we must strengthen the innovation and diversity of education and training forms. Give

full play to online and offline advantages. We should actively encourage the use of the training form of "double line promotion. " We should not only use mobile phones, TV and other clients for online training but also carry out offline training as always. Online mainly focuses on the release, dissemination, and collection of teaching information, and uploads teaching courseware for farmers to learn independently. It can also set up learning assistance groups between different regions online. Creatively introduce the "double teacher" teaching mode. The "double teacher" class refers to the teaching mode relying on the "Internet +" technology and combining online teaching with offline teaching scenes to improve teaching quality, improve learning efficiency, and solve the problem of insufficient high-quality teacher resources and low learning efficiency. The training mode of "double teacher" has been Horticulture by the School of Agronomy and Horticulture, Jiangsu Agricultural Vocational College is introduced into the training of new type of farmers (Appendix E). It provides a way for modern agricultural management training of new family farms.

From the stage of teaching input, In terms of selection, training, appointment, and assessment, it is necessary to formulate normative requirements for the main teaching teachers and offline teaching assistant teachers. "professional teachers" give online. "Teaching assistants" provide classroom services such as one-to-one targeted guidance, leak detection and filling, and consolidated practice with new family farmers in local classes. At the same time, teachers at the teaching end can also observe the classroom reception of new family farmers through the video equipment at the listening end, understand the needs of new family farmers, and adjust the teaching rhythm in real-time. The application of the dual teacher classroom has realized the efficiency of "1 + 1 > 2". Professional teachers give real-time lectures online, and offline teaching assistants give targeted guidance and teaching on the local scene. On the one hand, it restores the teaching scene of offline teaching to the greatest extent and meets the learning habits of farmers. The "double teacher" classroom solves the problem of insufficient and unstable teachers in the new family farmer education and training system. At the same time, it enables more farmers to share high-quality teaching resources. On the other hand, it enables the Internet and high-tech equipment. The novel learning mode can arouse the

interest of new family farmers in learning and improve the learning effect. Use teaching feedback optimization (Figure 3.8).

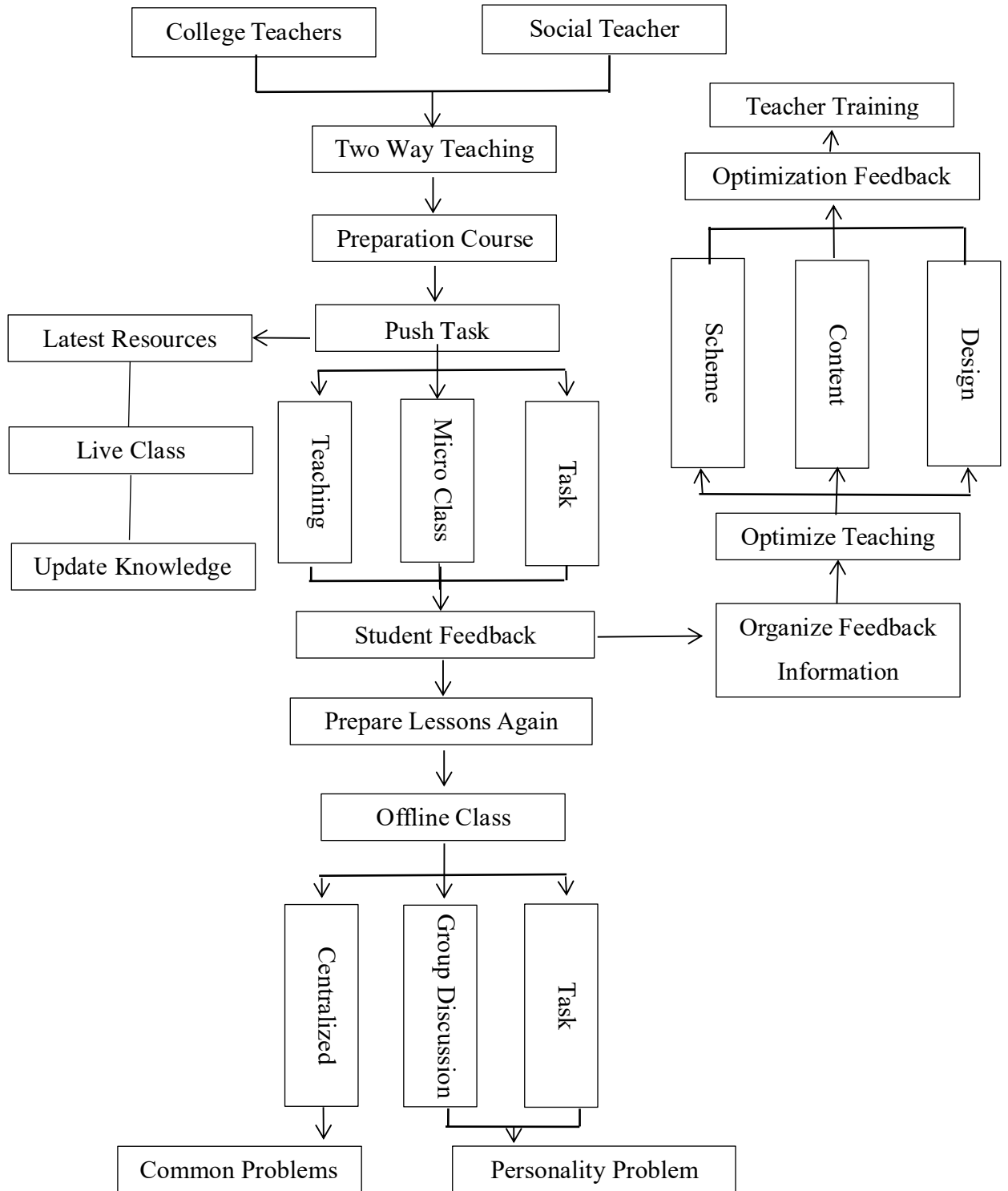


Figure 3.8 - Flow chart of "double teacher" teaching mode

Data source: Author's analysis and creation

Improving the timeliness of education and training content, promoting the

symmetry of supply and demand, and providing education and training of practical agricultural technology with strong timeliness are important means to improve the participation rate and effect of education and training. It is not only necessary to strengthen the contact between family farmers and education and training organizations, but also to standardize the process of management information circulation to promote the symmetry between the training content provided and the needs of farmers. Strengthen the comprehensiveness of the objects of support, increase the support, strengthen not only the support for farmers but also strengthen the support for education and training units. For farmers, we should strengthen economic subsidies and invisible support. Lower than education and training units, set up a special fund for family farm education and training, and resource sharing as soon as possible.

3.2 Organizational and economic mechanism of realization of a marketing complex in the environment "Internet+"

The main purpose of marketing agricultural products from family farms is to improve the economic and social benefits of family farms in the shortest time. As a separate part of the management of family farm development, it is important to implement the marketing complex in the "Internet+" environment, which is not only a necessary requirement for the development of family farms. At the same time, Efficient household farm agricultural product sales management is also an important link in the management process of family farm development, which can better improve the management process of family farm development. Through the implementation of a marketing mix in the Internet + environment, we can play an important role in realizing the core value of the enterprise. Carry out detailed analysis and research on consumers and market development by implementing a marketing mix in the Internet + environment to ensure that the agricultural products of family farms can meet the needs of consumers and the market. If the family farm's produce doesn't sell well, it will be difficult for the agricultural products of family farms to establish a good image in the hearts of consumers [198]. The sales of agricultural products are related to the management of the long-term

development of family farms. In addition, under the current market economy, family farms want to stand firm in the fierce market competition. Only by conforming to the times and market economy can they meet the social trend and realize the sustainable development of family farms. At present, China needs to change and innovate the original marketing channel mode of agricultural products. It needs to continuously improve the development management process according to the market demand and establish a new marketing channel system suitable for the development of the times.

The traditional marketing mode of agricultural products refers to the mode adopted by the groups and individuals engaged in the production and management of agricultural products in the marketing process, from the whole process of producer planting, operator processing and transportation, seller wholesale and retail to consumer use. In the process of traditional agricultural product marketing, face-to-face is generally adopted to achieve the purpose of sales through direct conversation the traditional agricultural product marketing mode. (Table 3.3).

Table 3.3 - Traditional agricultural product sales model

Producer	To					Consumer
	To				Retailer	
	To			Wholesaler	Retailer	
	To	Acquirer	To	Wholesaler	Retailer	
	To		Converter	Wholesaler	Retailer	
	To	Acquirer	Converter	Wholesaler	Retailer	
	Agent	Acquirer	Converter	Wholesaler	Retailer	

Data source: Literature collation and research induction

At present, the status quo of China's traditional agricultural product marketing system is mainly reflected in the following aspects: First, the commercialization rate of agricultural products has gradually increased. Since the reform and opening up, along with the development of productive forces, the rural economic structure has quietly changed. From the traditional way of planting crops to satisfy their food and clothing to the way of planting based on product sales, the commercialization rate of agricultural products has gradually increased. However, due to the production characteristics of

agricultural products, coupled with China's long-term smallholder farming methods, the degree of standardization of agricultural products is low. Second, the marketing of agricultural products is cyclical. The production of agricultural products is affected by the natural environment and natural laws and has seasonality. The supply of agricultural product marketing is naturally affected by seasonality, showing periodicity, which is manifested as a peak season and a low season in a year. In addition, due to the strong regionality and low circulation of traditional agricultural products, in the process of agricultural product marketing, it is necessary to reserve good sources of goods to solve seasonal and cyclical problems. Third, the marketing brand rate of agricultural products is low. Compared with other items, the homogeneity of agricultural products is relatively strong. Therefore, it is difficult to differentiate agricultural products. On the other hand, most of the agricultural products sold in the market are mainly original products, and those with deep processing and self-owned brands are still rare. Finally, the marketing of agricultural products is in the initial stage of distribution. The sales of agricultural products are still conducted in the traditional way. From acquisition to sales, modern methods are still rare. This initial sales method has not only long channels and many intermediate participants but also has unsound channel organization functions.

Compared with the traditional agricultural product marketing system, the "Internet + agricultural product marketing" system is more conducive to reducing agricultural product marketing costs, realizing information symmetry between the two parties, establishing a brand to develop domestic and foreign markets, and improving the quality of marketing services effective means of the new normal.

China is a big agricultural country, and the agricultural economy is the foundation of China's economy. Today, with the rapid development of the Internet, the scale of netizens has grown steadily. As of December 2021, the number of Chinese netizens reached 1.032 billion, an increase of 42.96 million from December 2020, and the Internet penetration rate reached 73.0% (Figure 3.9).

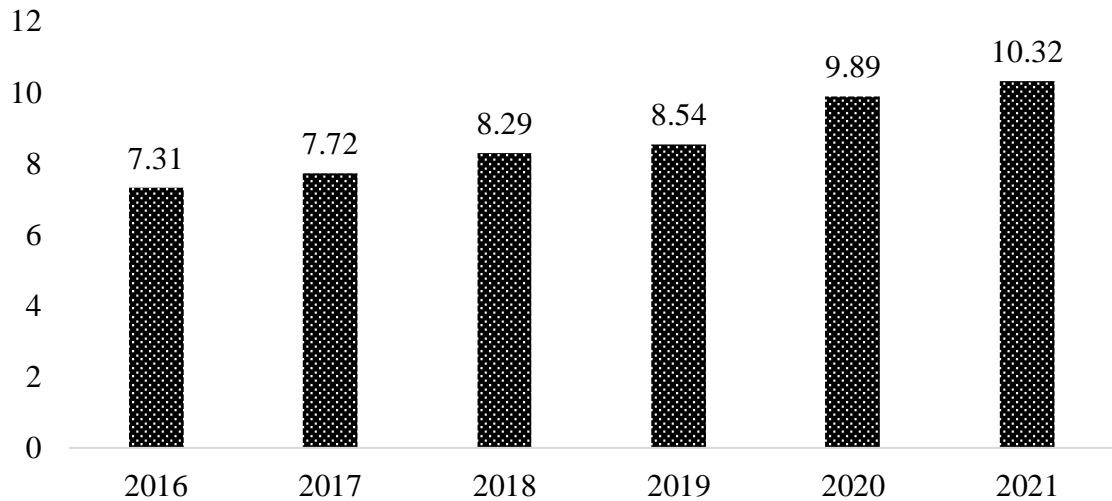


Figure 3.9 - China's Internet users from 2016 to 2021 (unit: 100 million)

Data source: <https://baijiahao.baidu.com/s?id=1725843779598745504&wfr=spider&for=pc> [199]

Among them, the scale of rural netizens has expanded. The number of rural netizens in China has reached 284 million, and the Internet penetration rate in rural areas is 57.6%, an increase of 1.7 percentage points from December 2020. This provides a certain foundation for China's "Internet + agricultural product channel selection and innovation. " (Figure 3.10).

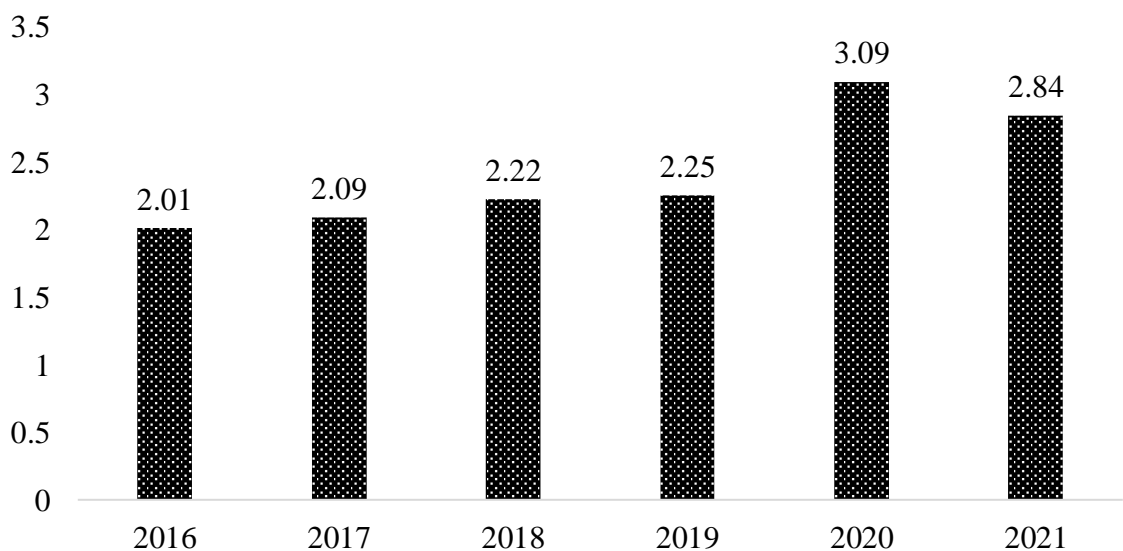


Figure 3.10 - Rural Internet users in China(unit: 100 million)

Data source: <https://baijiahao.baidu.com/s?id=1725843779598745504&wfr=spider&for=pc> [199]

With the theory and foundation, a further in-depth research is needed from an empirical point of view. To scientifically analyze the selection factors of agricultural product channels of Chinese family farms, a binary logistic model is used to bring variables into the model for evaluation, and the model is evaluated by SPSS22.0 measurement software. The regression results and influence coefficients are discussed and verified with the hypothesis. Understand what factors affect the choice of family farm channels, how to correctly choose the family farm agricultural product sales channels, and provide a foundation for the expansion and innovation of family farm agricultural product sales channels. First, make hypotheses :

H1: Older farmers are willing to choose enterprises and markets as their sales channels and have stable, reliable, and convenient sales channels.

H2: With high education and strong ability, farmers prefer to sell their products on markets.

H3: If farmers understand Internet sales (e.g., ways to save transaction costs and disseminate product information), they will use online electronic platforms to sell their products, and they are relatively unlikely to choose other channels.

H4: The sales area of agricultural products is large, and there are great risks. To avoid risks, farmers will choose cooperative organizations as the main sales channel.

H5: Family farms have formed their own brands, which are more competitive on the market and can better meet the needs of consumers. Therefore, they prefer to sell directly to consumers.

H6: The certification of agricultural products can ensure product quality and win the trust of consumers. It is more likely for family farms to choose direct sales.

H7: Corporate and partnership family farms with a good economic foundation and more resources are more likely to choose enterprises and markets as their sales channels and can obtain higher income.

H8: Individual industrial and commercial households and sole proprietorship enterprises with large business risks and lack of funds are more willing to sell their products to large sales households.

Modeling the influencing factors of the construction of agricultural product sales channels of family farms and using the binary Logistic model to analyze the selection status of agricultural product sales channels of family farms, the sales channel selection probability is expressed as formula (1).

$$\text{logit}(P) = O_0 + \beta_1 X_1 + \dots + \beta_p X_p \quad (1)$$

where X is a multi-classification variable, and it is inappropriate to fit only one regression coefficient by logistic regression. Therefore, the original multi-classification variable X_p is transformed into multiple dummy variables, and each dummy variable only represents the difference between several levels. In this paper, dummy variables are brought in when estimating the model. The set value of a channel selection in this range is 1, and the value of no channel selection in this range is 0. Each analysis process only deals with one group to estimate whether the impact result is significant in more detail. The specific classification of variables' codes (Table 3.4).

Table 3.4 - Classification of variables' codes

Index	Item	Frequency	Parameter coding				
			(1)	(2)	(3)	(4)	(5)
1	2	3	4	5	6	7	8
Age	30-39 years old	52	1	0	0	0	
	40-49 years old	82	0	1	0	0	
	50-59 years old	26	0	0	1	0	
	Above 60 years old	2	0	0	0	1	
Education level	Junior high school or below	28	1	0	0	0	0
	High school or technical secondary school	46	0	1	0	0	0
	Junior college	44	0	0	1	0	0
	Undergraduate college	42	0	0	0	1	0
	Bachelor's degree or above	2	0	0	0	0	1
Sales area	Periphery	44	1	0	0	0	
	Inside the city	38	0	1	0	0	
	In the Province	36	0	0	1	0	
	Outside the Province	44	0	0	0	1	
Brand	Yes	106	1	0			
	No	56	0	1			
Product certification	Pollution-free certification	60	1	0	0	0	
	Green food certification	62	0	1	0	0	
	Organic food certification	14	0	0	1	0	
	No certification	26	0	0	0	1	
Business form	Individual industrial and commercial household	54	1	0	0	0	
	Sole proprietorship	60	0	1	0	0	

Continuation of table 3.4

1	2	3	4	5	6	7	8
	Partnership	24	0	0	1	0	
	Company system	24	0	0	0	1	
Operating income	Downturn	8	1	0	0	0	0
	Remain unchanged	36	0	1	0	0	0
	Steady growth	88	0	0	1	0	0
	Rapid growth	26	0	0	0	1	0
	Irregular change	4	0	0	0	0	1

Note: Green food in China refers to safe and high-quality edible agricultural products and products produced in an excellent ecological environment per the highest food standards.

Source: compiled by the author

According to the survey and statistics, the family farms' sales channels mainly include enterprises, online electronic platforms, fair markets, cooperative organizations, professional markets, sales companies, large sales households, and consumers. Among them, consumers, enterprises, and large sales households are the main sales channels. The sales to consumers account for the largest proportion, 17.3%, mainly because family farms can sell agricultural products in the surrounding areas using their own human and material resources, with flexible sales and large benefits for farmers, avoiding the expenses spent for intermediaries and retailers. The second channel (direct sales to enterprises) accounts for 15.3%. Enterprises usually cooperate with family farms in the form of orders, the price and demand are stable, and uncertain factors are reduced. 15.2% of family farms choose to sell their products to large sales households, mainly because this sales method has strong adaptability (can be adapted to various agricultural products) and is stable. The higher the sales of agricultural products, the better the farm income, which can mobilize the enthusiasm of farmers.

In recent years, with the development of Internet technologies, online electronic platforms, as an emerging sales method, have developed rapidly. However, few family farms in Henan Province choose this channel, accounting for 9.30%, ranking seventh among all sales channels. This result is due to the low popularity of network knowledge among family farmers and poor understanding of Internet sales. There is no deep excavation of the potential of Internet sales (Table 3.5).

Table 3.5 - Selection of sales channels by family farms

Sales channel type	Number of farms	Proportion (%)
Enterprises	41	15.30
Online electronic platforms	25	9.30
Markets	36	13.20
Cooperative organizations	25	9.40
Professional markets	35	12.90
Sales enterprise	20	7.50
Big sellers	41	15.20
Consumers	47	17.30
Total	270	100.00

Note: A family farm does not necessarily have only one sales channel.

Using SPSS 22.0 measurement software, the logistic model was estimated. According to the model results, the fitting and explanatory variables pass the statistical test. Some variables have a significant impact on the selection of sales channels for family farms. The specific impact mode, impact degree, and regression results. (Table 3.6)

Table 3.6 - Regression results

Variable		Sales enterprise	Online electronic platforms	Market	Cooperative organizations	Big sellers	Consumers
1	2	3	4	5	6	7	8
Business form	Company system	-2.13	-1.21	0.62	3.22	2.11	0.31
	Individual industrial and commercial household	-3.47	-1.46	2.77	-9.38**	3.54*	-2.52
	Sole proprietorship	-6.21**	-0.60	0.81	-1.91	3.33*	-4.16
	Partnership	-1.22	-1.78	4.29*	-5.35	2.45	-6.2*
Age	Above 60 years old	21.12	18.21	13.86	-23.65	-13.43	-19.52
	30-39 years old	28.21	15.89	21.02	-30.05	-17.20	-21.45
	40-49 years old	29.42	17.15	19.94	-27.81	-18.65	-21.755
	50-59 years old	21.18	17.21	15.08	-26.94	-20.11	-20.67
Sales area	Outside the Province	5.36	3.65	-5.68	2.43	-3.56	0.12
	Periphery	2.85	1.65	-2.56	1.10	-2.44	0.60
	Inside the city	4.80*	2.19	-0.58	8.98**	-1.32	0.79
	In the Province	-0.65	-1.66	-1.94	-1.55	-3.28	3.50
Understanding of Internet sales	understand	-3.31*	0.74	-2.48*	-9.23**	-1.72	-0.71
Education level	Bachelor or higher	18.62	-21.21	14.32	-23.76	-21.21	-10.12
	Junior high school or below	15.83	-23.96	14.06	-40.64	-26.18	-15.33

Continuation of table 3.6

1	2	3	4	5	6	7	8
	High school	14.29	-22.87	17.89	-35.02	-26.07	-15.82
	Junior college	19.75	-22.98	15.87	-37.53	-26.47	-12.65
	Undergraduate college	17.59	-23.34	17.30	-30.25	-26.55	-17.96
Brand	Yes	-3.01**	1.96*	-0.75	-6.43**	-1.49*	2.57**
Product certification	No certification	1.26	0.21	6.58	4.32	1.12	9.52
	Pollution-free certification	5.95**	6.56	-3.16**	0.84	1.55	-0.92
	Green food certification	9.20**	7.99	-4.18**	5.31**	-1.02	-0.15
	Organic food certification	2.24	9.99	-8.05*	-0.84	1.11	3.19
Operating income	Irregular change	21.32	-1.32	2.11	11.65	12.34	1.75
	Slide downward	32.05	-15.96	1.10	-3.56	18.75	-1.73
	Remain unchanged	26.42	0.62	-2.19	10.65	20.15	-2.29
	Steady growth	23.73	1.58	-1.29	18.22	20.51	-2.75
	Rapid growth	25.46	4.41	-0.02	13.35	22.94	-4.16

Note: * and ** indicate passing the significance test with a levels of 10% and 5% respectively.

The results show that the main sales channels for family farms are consumers, enterprises, and large sales households, accounting for 17.3%, 15.3%, and 15.2%, respectively. Brand and form of operation have a significant impact on the choice of sales channels for most family farms. The farmers' age, education, understanding of Internet sales, the sales area of agricultural products, product certification, and other factors have a general impact on the choice of sales channels.

According to the regression results of the logistic model by SPSS 22.0 measurement software, discuss and test hypotheses.

Considering H1, older farmers tend to choose enterprises and markets as the main sales channels, which is consistent with the theoretical assumptions. Among the 170 family farms surveyed, 82 chose enterprises. The main reason is that enterprises offer guarantees, and the income is stable. Therefore, the older the farmer, the stronger the dependence on this channel. The farm and the enterprise have formed a certain degree of cooperation and trust relationship based on the transaction, which is consistent with the assumptions. The fair market enables farmers to face the market directly, understand market information, and better guide their production, which is also a sales channel recognized by older farmers.

Considering H2, the farmers' education level did not pass the significance test and thus has no impact on the channel selection, mainly because the sample investigated in this paper could not test the impact of this variable on the channel. Through the study of the existing literature, it is found that farmers with higher education tend to choose the market.

Considering H3, farmers' understanding of Internet sales has a certain impact on the choice of enterprises, fair markets, and cooperative organizations as main sales channels. The regression coefficients of the three items are negative. It shows that the more farmers know about Internet sales, the less likely they are to choose enterprises, fair markets, and cooperative organizations as sales channels, which is consistent with the theoretical assumptions. The reason is that if farmers know about Internet sales, they will be more willing to choose the internet-based online electronic platforms for sales to strengthen the scope of publicity, transmit more product information, reduce agency fees at all levels, and save costs.

Considering H4, the sales area of agricultural products has the most significant impact on the choice of enterprises and cooperative organizations as main sales channels. The regression coefficients of both variables are positive, indicating that the farther the sales area of agricultural products is, the more inclined it is to choose cooperative organizations, which is consistent with the theoretical assumptions. This is mainly because cooperative organizations are conducive to solving the contradiction between "small farmers" and "big markets," reducing risks, centralizing scattered agricultural products, and making it possible to reprocess and realize value-added agricultural products. If farmers want to sell agricultural products further and radiate a wider range, a cooperative organization is a better choice. Farms selling agricultural products in the city will also choose enterprises, which can help to avoid risks effectively.

Considering H5, agricultural brands have no significant impact on the market channel and have a certain impact on other channels. Among them, the regression coefficients of enterprises, cooperative organizations, and large sales households are negative, and the regression coefficients of online electronic platforms and consumers are positive. It shows that farms with branded agricultural products are more likely to sell to

consumers on online electronic platforms and are less likely to choose other sales channels, which is consistent with the theoretical assumptions. Establishing a brand for a family farm is the extension of the quality of agricultural products and their intangible benefits. It plays a very important role in developing family farms and product sales. Therefore, selling branded agricultural products through online electronic platforms can improve the popularity of the farm and expand its market share. Brands can better convey information to consumers, establish their uniqueness in the eyes of consumers, and better meet their needs. Branded agricultural products can also obtain greater benefits through direct sales.

Considering H6, product certification has an impact on enterprises, markets, and cooperative organizations. The regression coefficients of enterprises and cooperative organizations are positive, and the regression coefficient of the market is negative. This shows that farms with certified agricultural products are more willing to choose enterprises and cooperative organizations, which contradicts the theoretical assumptions. This is mainly because enterprises and cooperative organizations pay more attention to the quality and value of medium-sized agricultural products. Farms will be more willing to cooperate with enterprises and cooperative organizations, which is conducive to product sales.

Considering H7, family farms operating in the form of a company system tend to be more popular for enterprises and markets that purchase their products and sell them to consumers. Since a company is a legal entity, it can obtain more resources and will choose channels with stable and high income. The partnership family farm will choose to sell in the market rather than directly to consumers, which is consistent with the theoretical assumptions.

Considering H8, individual industrial and commercial households are more likely to choose large sales households but less likely to choose cooperative organizations. The reason is that large sales households can sell different agricultural products offering good stability. Family farms of sole proprietorship enterprises are generally small in scale, with loose establishment conditions and flexible access to or exit from the market, so they are more willing to sell to large sales households.

In terms of family farmers' characteristics, the age of family farmers has an impact on the choice of enterprises and markets; the older the farmer, the greater the impact on the choice of these channels. In terms of farms' characteristics, the business form has no great effect on online electronic platforms and has a significant impact on the choice of enterprises, fair markets, cooperative organizations, large sales households, and consumers. The regression coefficients of enterprises, cooperative organizations, and consumers are negative, while others are positive. The operating income of family farms has no significant impact on the choice of agricultural sales channels. A description is not the main influencing factor.

The results show that the main sales channels of family farms are selling agricultural products to consumers, purchasing by enterprises, and selling to large sales households, accounting for 17.3%, 15.3%, and 15.2%, respectively; Family farm agricultural product brands and certification, business form, and understanding of Internet sales have a significant impact on the choice of sales channels. The farmer's age, education level, agricultural product sales area, and other factors have a general impact on the choice of sales channels for family farms.

Family farm agricultural product certification, brand, and management form have an obviously influence on the sales channel of family farm agricultural products. According to statistical data, among the marketing channels of agricultural products of family farms, the traditional spot trading channel is still the mainstream sales channel of family farms. Among all eight sales channels, the Internet platform channel accounts for 9.40%, ranking seventh. It shows that Internet marketing has not yet played its potential in the sales channels of agricultural products of family farms. At the same time, it can also be seen that family farmers have not integrated with the market in the management process of family farm development and have not integrated into the macro benefits brought by "Internet +." The marketing links in the management process need to be improved.

Under the background of "Internet +," the management process of the development of family farms in Henan Province needs to be improved. There are problems with individual links. The personal growth and quality of family farmers need to be improved.

Especially in the sales link, the selection and innovation of agricultural product sales channels are not enough. From the calculation results in the model, it can be clearly seen that in the network platform sales channels of family farm agricultural products, due to the family farmer's awareness, facilities, and environmental factors, the potential ability of the Internet is not fully explored. At the same time, with the abundance of material materials, people have gradually changed from "eating full" to "eating well" and "eating healthy." It is confirmed in the model that agricultural products have brand and certification and occupy a great advantage in sales. Family farms still need to make efforts to strengthen the brand creation and certification of agricultural products. The solution of problems can better improve the management process of family farm development [200].

Based on the above analysis, according to the survey results, the following suggestions are put forward for the innovation and selection of family farm agricultural product management channels.

Improve the cultural quality of farmers and carry out the training of new farmers. At present, family farmers in China are mainly farmers with low average education levels, lack theoretical knowledge of management, and rely more on experience. Improving the cultural quality of farmers is an objective requirement for promoting agricultural industrialization and developing modern agriculture; an urgent need for the vast number of farmers to acquire agricultural knowledge and skills and an effective measure to adjust the agricultural structure and promote production and income. Use the Internet to promote the development of family farms, family farmers must master certain knowledge of Internet-related fields and be able to use the Internet to manage the production and operation activities of family farms. Governments of at all levels attach great importance to the training of new professional farmers, innovate working ideas and take effective measures. Therefore, it is necessary to carry out the action of improving farmers' academic qualifications to continuously improve the level and systematization of farmers' education and training.

Strengthen the brand building of family farm agricultural products in various aspects. The brand is the main symbol that distinguishes its products from other competitive products. It is also a kind of value concept and spiritual symbol and also an

important embodiment of the core value of products. Under the current background of agricultural industrialization, the competition for agricultural products is intensifying. The most effective way for family farms to stay in the completely competitive market of agricultural products and stand out is to build their own brands. Family farms mainly establish brand awareness, fully recognize the important role of agricultural product brands in market competition, actively learn and understand the knowledge related to brand construction, improve their quality, and actively seek help from the government or relevant professionals. According to the advantages and characteristics of its own products, select the appropriate target market, and determine a brand positioning that meets the consumer demand and has its own characteristics; At the same time, do a good job in the publicity and promotion of agricultural product brands, and expand the brand influence through direct sales, online marketing, agricultural product exhibition, and other channels.

Expand the sales channels of family farms, and realize the docking of agricultural products production and marketing through mobile e-commerce with the help of "Internet +." In recent years, the new modern marketing formats have gradually stepped into the field of agricultural product sales and launched fierce competition with traditional direct sales, which makes the sales channels of family farms face great challenges. They lack the right to speak in market competition and can not effectively resist the reality of market risks. Family farms can take advantage of the advantages of the Internet, cooperate with e-commerce, sign agreements with logistics enterprises and payment platforms, and create a new mode of direct online sales of agricultural products. With the help of "Internet +," information can be quickly, directly, and effectively transmitted between the two parties, eliminating unnecessary intermediate links, improving the efficiency of network marketing, reducing marketing costs, and improving the efficiency of agricultural product circulation, which can not only ensure the quality of agricultural products but also enable the supply and demand sides to obtain practical benefits.

Through practice, signed agricultural products + Wechat group sales channel with Nongle Family Farm (Appendix F). By referring to the family farm produce + "Wechat group" sales model, the sales channels of agricultural products were broadened and the

family farms income was increased. This project was approved by the Wechat Business Association of Xinxiang City, Henan Province, and was approved on January 1, 2020. So far, WeChat group turnover exceeds more than 1 million yuan (Appendix G), profit is 260,000 yuan (Appendix H).

Agricultural modernization requires a large amount of financial support. Government departments should increase agricultural subsidies and tilt the special funds to family farms. The government should speed up the improvement of the new agricultural social service system, release agricultural production information to family farmers through the Internet platform, and regularly train farmers to improve their business ability and internet technology application ability effectively. In addition, the government should give full play to its role, strengthen the brand building and publicity of agricultural products, actively promote the "docking of farmers and supermarkets," rural e-commerce, and other projects, innovate the sales channels of agricultural products, and promote the sales of agricultural products.

3.3 Prospects for the implementation of the crowdfunding strategy in the activities of family farms

Since 2003, the rapid development of family farms has led to the improvement of agricultural level, and stimulated the vitality of rural areas, and provide the basis for sustainable development of agriculture and guaranteed rural revitalization [201]. However, in the development process of family farms, due to the high risk of agricultural production, and low rate of return, the scale needs to be expanded, and for other reasons, the demand, and dependence of family farms on funds are becoming stronger and stronger [202]. Due to the lack of fixed assets and other reasons, most family farms are difficult to meet the conditions of bank loans, and the financing problem seriously restricts the development of family farms. Therefore, the healthy development of family farms needs to strengthen the research on the financing of family farms. To better understand the financing situation of family farms, the author conducted research on family farms in the form of questionnaires and field visits. A total of 186 family farms were investigated for

effective data. After data collection. Conduct empirical analysis on the financing management factors of family farms. Assign values to variable definitions, as shown in Table 3.7. In this paper, the dual choice structure of "obtaining loan" and "not obtaining loan" is used to measure the financing of family farms. That is, the financing probability of 137 family farms is 1, and that of 49 family farms is 0.

Table 3.7 - Variable description and variable value

Investigation items	Variable description	Variable value
	Loan availability(Y)	No loan obtained = 0 Get loan = 1
Farmer's personal characteristics	X1 = age	Actual age (years)
	X2 = years of Education	Actual years of Education
	X3=Is there any social relationship	no = 0 yes = 1
	X4=Is it a village cadre	no = 0 yes = 1
Management characteristics of family farm	X5= number of workers	Number of permanent workers (person)
	X6 = do you have your own trademark	no = 0 yes = 1
	X7 = farm establishment time	Actual operating time (year)
	X8 = Land area	Actual total land area
	X9 = average annual profit	Average total profit of family farm in recent three years (10000 yuan)
	X10 = land transfer period	Term of land transfer (year)
	X11 = Proportion of self owned funds	no = 1 yes = 2
	X12 = is the financial management of family farm standardized	no = 1 yes = 2
	X13 = Whether To Purchase Policy Agricultural Insurance	no = 1 yes = 2
Qualified loan conditions	X14= whether there are mortgaged assets or others' guarantee	no = 1 yes = 2
	X15= bad credit record	no = 1 yes = 2
Government policy	X16 = whether it meets the conditions of government subsidies	no = 1 yes = 2

Using SPSS 22.0 statistical analysis software, this paper makes a binary logistic regression analysis on the survey data of family farms; the results are as follows:

Table 3.8 - Regression results of factors affecting the availability of family farm loans

Investigation items	Variable	Coefficient	Standard error	Wald	P value
Farmer's personal characteristics	X1 = age	-0.035	0.026	0.232	0.896
	X2 = years of Education	0.354	0.451	0.306	0.723
	X3=Is there any social relationship	0.168	0.322	2.201	0.098
	X4=Is it a village cadre	0.012	0.035	0.056	0.541
Management characteristics of family farm	X5 = number of workers	0.434	0.0647	0.122	0.417
	X6= do you have your own trademark	0.551	0.234	5.415	0.000***
	X7 = farm establishment time	0.057	0.194	0.352	0.643
	X8 = land	0.602	1.140	0.377	0.517
	X9 = average annual profit	0.546	0.820	7.257	0.000***
	X10 = land transfer period	0.168	0.046	2.660	0.042
	X11 = Proportion of self owned funds	0.556	0.846	0.422	0.652
	X12 = is the financial management of family farm standardized	0.708	0.323	6.542	0.000***
	X13= whether to purchase policy agricultural insurance	0.419	0.326	5.387	0.020**
Qualified loan conditions	X14 = whether there are mortgaged assets or others' guarantee	0.638	0.353	8.924	0.000***
	X15 = bad credit record	0.308	0.642	4.126	0.039**
government policy	X16 = whether it meets the conditions of government subsidies	0.427	0.657	2.357	0.021*

Note: *, ** and *** indicate significant influence at 10%, 5% and 1% respectively.

According to the above analysis, the factors affecting family farm financing mainly include average annual profit, whether there is a registered trademark, the degree of financial management standardization of the family farm, whether it has purchased agricultural insurance, whether it has collateral, credit record, whether it complies with family farm support policies, etc. these factors have a significant impact on family farm financing. Still, impact depth is different, The order is: whether there is collateral, average annual profit, the degree of financial management standardization of family farms,

whether there are registered trademarks, whether they have purchased agricultural insurance, credit records, and whether they comply with the family farm support policies. From the perspective of traditional finance, the difficulties faced by family farm financing include high financing thresholds, information asymmetry, high default risk, scattered loan objects, higher cost of unit loan verification, and the lack of effective collateral. Details are as follows:

The credit system is imperfect and lacks effective information. At present, family farms are still in the primary stage of development on the whole, with loose internal management, rather non-standard financial management, no formed account books and statements, and low transparency of financial information. As a new type of business entity, family farms have not been included in the credit reporting system. Financial institutions are unable to query their relevant credit information, understand and track the credit and risk status of the loan objects, and judge and evaluate their credit risks, which has greatly affected the enthusiasm of financial institutions for loans.

The financing threshold for family farms is high. At present, the channels through which family farms can obtain funds can be divided into formal finance and informal finance. In terms of formal financial channels, most commercial banks exclude family farms, which are relatively small business entities. Generally, small and medium-sized financial institutions provide financing support in two main ways: first, small credit loans, which are generally less than 50000 yuan, are difficult to meet the financing needs of family farms; The second is secured loans, which need to provide collateral such as land and delivery room equipment. However, due to the lack of sufficient collateral, family farms are difficult to obtain such loans. In terms of informal financial channels, family farms mainly rely on mutual loans between relatives and friends. Their financing scale is small, and the scope of borrowers is limited.

High operating risk and borrowing cost. Due to the weakness of agriculture itself and the limitations of family farms in terms of business scale, management ability, and technical level, family farms have weak risk resistance. On the one hand, factors such as the weak nature of agriculture and the uncertainty of the production process lead to large and diverse natural risks in agricultural production. However, agricultural insurance has

a single type, low coverage, insufficient security, and even costs cannot be covered, which makes it difficult to play a role in suppressing risks; On the other hand, the internal management mechanism of family farms is not perfect, and the information transparency is low. These two aspects lead to the high risk and high cost of the family farm operation. Therefore, based on the principle of risk-return and cost coverage, financial institutions usually require higher interest rate returns on family farm loans, thus increasing the cost of family farm loans.

Lack of adequate collateral for loans. At present, the most effective collateral in rural areas is land-related rights. Still, family farms are facing legal difficulties if they want to use land use income rights for mortgage loans. The land managed by family farms is land transferred in various forms. At present, in the process of continuous reform of the rural land contractual management right, although the ownership, contractual right, and management right of rural land have been separated theoretically and legally, the mortgage value of the family farm's land, real estate, building and use houses, greenhouse greenhouses, agricultural machinery, and other assets is difficult to realize. Restricted by this situation, the bank takes a more cautious attitude towards the mortgage application of family farms.

In traditional financial activities, to ensure the recoverability of loans, financial institutions usually set up complex risk management procedures such as mortgages, pledges, and third-party guarantees. At the same time, because the amount of family farm financing is small, its unit financing cost is relatively high. Therefore, financial institutions are cautious about the loan demand of family farms and even refuse to grant loans; At the same time, family farms will not give priority to traditional bank credit due to high costs and cumbersome procedures. Therefore, to solve the problem of family farm financing, we must find a new financing model. With the continuous deepening of the application of Internet technology, Internet finance based on the Internet spirit of "openness, equality, collaboration, and sharing" may be a new option, and agricultural crowdfunding is an important path.

From the perspective of its characteristics, family farms can do more with one stroke to carry out crowdfunding projects. First of all, family farms have been in a weak

position in financing for a long time. The crowdfunding model of family farms has effectively solved the problem of financing difficulties of family farms. The latest data of the "Three Rural" Internet Finance Blue Book shows that the effective supply of "Three Rural" finance is seriously lacking. For family farms, crowdfunding is a new Internet financing method. Compared with borrowing from financial institutions, raising funds from investors interested in family farm projects is undoubtedly the perfect choice. At the same time, through crowdfunding, family farms have also changed the traditional production and sales model of agricultural products to a certain extent. When customers place orders in advance, family farms can quickly solve the problem of capital circulation, raise funds needed for production, and realize the effective use of idle funds. Secondly, as a new Internet financing model, crowdfunding can also effectively encourage family farms to carry out technological innovation. For the development of family farms, agricultural science, and technology innovation is the key. The crowdfunding model requires family farms to use multiple ways to comprehensively introduce their own products, optimize their own production and operation system, and promote technological innovation and development. In addition, crowdfunding can also effectively mobilize social forces to solve the problem of local poverty, promote urban people to experience in rural areas, promote the employment of young intellectuals in rural areas, and guide modern science and technology to feed agriculture. It plays an important role in promoting the construction of beautiful villages and driving the development of agriculture, rural areas, and farmers. Making full use of family farm crowdfunding can not only further consolidate the basic position of local agriculture, but also activate rural financial development and form a new rural economic growth point. In a word, the application of family farm crowdfunding model can integrate the resources required by the agricultural industry chain, generate effective chemical reactions, and effectively improve the management process of family farm development. Promote sustainable development management of family farms.

According to the above empirical research shows. in traditional financial activities, in order to ensure the recoverability of loans, financial institutions usually set up complex risk management procedures such as mortgages, pledges, third-party guarantees, etc. At

the same time, because the amount of family farm financing is small, its unit financing cost is relatively high. Therefore, financial institutions are cautious about the loan demand of family farms and even refuse to grant loans; At the same time, family farms will not give priority to traditional bank credit due to high costs and cumbersome procedures [203]. Therefore, to solve the problem of family farm financing, we must find a new financing model. With the continuous deepening of the application of Internet technology, Internet finance based on the Internet spirit of "openness, equality, collaboration, and sharing" may be a new option, and agricultural crowdfunding is one of the important solutions. The advantages, disadvantages, and strategies of agricultural crowdfunding in solving family farm financing are as follows:

Table 3.9 - Crowdfunding advantages, Current situation, and Strategies

Disadvantages of traditional financing methods	Advantages of agricultural crowdfunding in family farm financing	Current status of family farm crowdfunding	Crowdfunding strategy for future family farms
Incomplete credit system and lack of effective information	Information symmetry of crowdfunding	Information asymmetry among crowdfunding platforms, project initiators and investors.	Improve rural Internet hardware and software infrastructure. Strengthen the publicity, guidance and skill training of agricultural crowdfunding.
High operating risk and borrowing cost.	Low risk of crowdfunding	Risks of agriculture itself	Do a good job in risk management and reduce project implementation risk.
The financing threshold for family farms is high.	Low requirements for crowdfunding	There is a lack of laws related to agricultural crowdfunding, and there are regulatory risks.	Improve the awareness of Internet Finance and integrity of family farms
Lack of adequate collateral for loans.	Crowdfunding is highly trusted by all parties.	The trust mechanism between investors and project sponsors is not perfect.	Innovate crowdfunding forms to promote the sustainable and healthy development of agricultural crowdfunding.

Data source: Literature collation and research induction

Information symmetry of crowdfunding, agricultural crowdfunding based on Internet financial technology has improved information transparency, because the demanders of household farm agricultural products can understand the relevant

information of agricultural production through the crowdfunding platform; It can timely and comprehensively understand the financing process of family farms, product transaction records, other consumers' evaluation of farms and their products and other information, and use cloud computing to analyze relevant data; The family farm can also collect relevant information through the open network platform, analyze and identify it, and then break the barriers of the original information of the financing parties.

The risk of crowdfunding is low. Compared with traditional financing methods, crowdfunding is less risky for family farms. In general, the specific implementation of crowdfunding is not officially started until the financing target is reached, which means that the family farm produces on the premise that the income is relatively certain, and the production activities of the family farm are carried out according to the plan, which can be understood as the "group purchase" + "pre-purchase" operation mode, which is an "order based" production, which can avoid the passive mode of post-production sales of traditional market players, This greatly reduces the risk of family farm financing. The agricultural crowdfunding model directly connects consumers and agricultural producers through the crowdfunding platform, shortening the circulation chain of agricultural products and reducing production costs. For the investor, the fund will enter the third-party account and be supervised by the crowdfunding platform. A certain proportion of the margin will be collected to protect the interests of the investor. Some equity financing will also introduce a third-party guarantee; that is, the capital security of the investor will be guaranteed by a third-party guarantee institution. Therefore, the risk of crowdfunding is relatively low for both parties. (Figure 3.11 and 3.12)

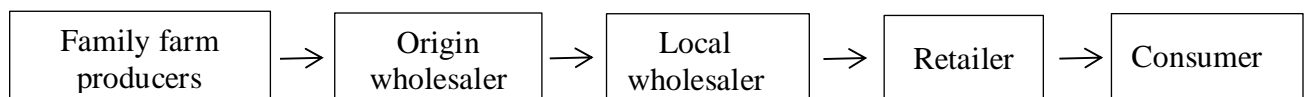


Figure 3.11 - Traditional circulation mode of agricultural products

Data source: Author's summary

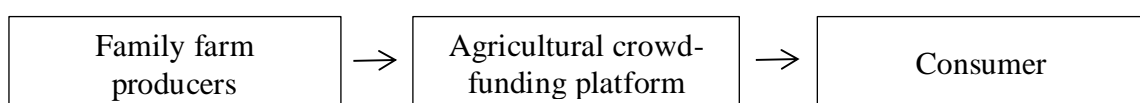


Figure 3.12 - The circulation mode of agricultural crowdfunding

Data source: Author's summary

Low requirements for crowdfunding. Compared with the traditional bank credit model, the threshold of crowdfunding financing is relatively low, which is mainly reflected in the following: as long as its creative value or product services are recognized by the majority of investors, the probability of crowdfunding financing success is high. The advantage of family farm agricultural products lies in their original ecology. As long as the family farm ensures the quality and safety of agricultural products and has some unique advantages, or the project is creative, the probability of financing success will increase significantly in today's increasingly prominent agricultural product safety issues and rising online consumption.

Crowdfunding parties have a high degree of trust. When traditional finance considers granting credit, it generally focuses on the credit of the credit subject rather than the feasibility of the credit project itself; The agricultural crowdfunding platform mainly investigates the feasibility of the financing project itself. As long as the financing project is feasible, it can enter into crowdfunding financing. Therefore, as long as the project is feasible and approved by the investor, can be successfully financed. For investors, due to the supervision of crowdfunding platforms, third-party trusteeship, and the margin of project sponsors and other implicit guarantees, the risk is small. In addition, some crowdfunding financing also relies on third-party guarantees, and third-party institutions provide explicit guarantees for a certain period of time. If the financing project fails, investors will receive full compensation from the guarantee institutions. Therefore, as long as the operation is standardized, crowdfunding can be trusted by all parties.

Family farm crowdfunding models are often divided into two types. One is consumer crowdfunding. This model mainly takes agricultural products as the return. The essence of consumer crowdfunding is to reverse the production and marketing order of traditional agriculture. Agricultural project sponsors introduce their farms or agricultural products to investors through the platform, and investors subscribe to products or farms. When the products are mature, the project sponsors mail the products to investors. In the specific operation process, the production process of agricultural products can be reflected by modern testing techniques. At the same time, investors can also carry out their own planting, playing, and other activities. At present, China's agricultural

crowdfunding mostly adopts this model. Make an equity crowdfunding model. Equity-based crowdfunding refers to a crowdfunding model that uses land use rights or project equity as a return to obtain investors' funds. A crowdfunding model in which the family farm that needs to raise funds first issues shares on the crowdfunding platform, and then the investor directly subscribes to the shares of the fundraising company through the platform to distribute dividends within a certain period of time. The agricultural equity crowdfunding mode is to raise funds through the Internet financial crowdfunding mode, which has got rid of the complicated loan procedures and high threshold of traditional financial institutions.

Introduce crowdfunding into the family farm financing environment through the following methods and processes. The process of household farm financing through agricultural crowdfunding platforms is relatively simple compared with traditional finance such as traditional bank loans. The main parties involved in its operation are financiers (family farms), crowdfunding platforms, and funders. Among them, due to the difference between agricultural products pre-purchase crowdfunding and agricultural equity crowdfunding, the identity of investors is different. For the former, investors are consumers of agricultural products, while the latter are equity investors of family farms. The process can be simply divided into four steps: first, the family farm will upload the agricultural crowdfunding plan, and financing needs to the crowdfunding platform for review; Second, after the project is approved, the crowdfunding platform will display and promote the project, so that investors (including individuals and institutions) who have consumption or investment intentions can pay attention to and understand the project and then invest in the project; Step 3: If the financing goal of the project is achieved, the fund of the investor will be transferred to the fund account of the family farm or the third-party account within the fundraising period. If the fund raised fails to meet the goal, the fund will be returned to the investor, and the crowdfunding project will be terminated; Step 4: After the implementation of the project, the family farm will return the corresponding agricultural products or equity certificates, dividends and other forms to the investor, and the crowdfunding will end. (Figure 3.13)

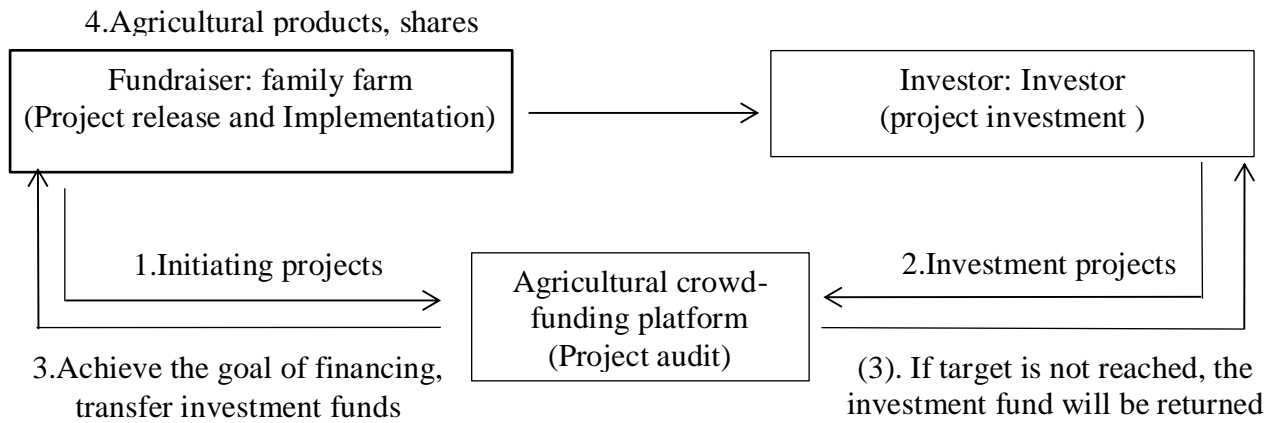


Figure 3.13 - Family farm crowdfunding process

Data Source: Statistics by the authors

However, the new things will have some deficiencies and shortcomings. At present, China's family farm crowdfunding is still in the primary stage, similar to the family farm financing situation, which is relatively difficult. The main obstacles are:

Natural disasters and market risks. The output of agricultural crowdfunding investment activities usually emphasizes the return on agricultural products. It should be noted that during agricultural production, product quality is often subject to the in-depth impact of natural factors, especially in the case of a certain type of agricultural product's low resistance to climate and pest disasters. In addition to causing yield reduction, it is also impossible to ensure accurate prediction of future specific harvest effectiveness.

Information asymmetry among crowdfunding platforms, project sponsors, and investors. Between the sponsors of crowdfunding projects and the platform, and between investors and the platform, the sponsors of crowdfunding projects are carried out through the platform. Because the laws and regulations of China's crowdfunding platforms are not perfect, investors and project sponsors do not know whether the platform is formal. As the intermediary between the project sponsors and investors, the platform is opaque in the middle process, which is not convenient for supervision, and whether the funds are fully given to the project sponsors is not clear. There is a risk that the platform will lose its credibility. On the other hand, most crowdfunding platforms do not have a mature credit evaluation mechanism for project sponsors. There are no restrictions for project sponsors

to enter the platform, and the platform does not know enough about project sponsors. After the funds are given to the project sponsor, there is also a risk that the project sponsor will break his promise. Even if some platforms reserve part of the margin, if the project fails, only the margin will be returned to the investors.

The trust mechanism between investors and project sponsors is not perfect. In terms of purchasing agricultural products, consumers are more accustomed to traditional consumption methods. Agricultural crowdfunding is similar to online shopping. Investors have given funds in advance, and the products they receive in the future may not be consistent with their expectations. Crowdfunding often fails to see the physical objects at the initial stage of investment, investors do not trust the quality of products, and the participation process is often long, leading to insufficient attraction of family farm crowdfunding to investors.

Laws related to agricultural crowdfunding are lacking and there are regulatory risks. At present, China has no laws and regulations on agricultural crowdfunding, and the regulatory process of agricultural crowdfunding cannot be effectively standardized.

Improve rural Internet crowdfunding hardware and software. Internet finance should serve rural areas. The primary task is to improve rural Internet infrastructure and provide a guarantee for the development of rural Internet finance. First of all, local governments at all levels should encourage social capital, such as network operators, financial enterprises, and other enterprises to invest in infrastructure, such as relevant hardware equipment required for rural Internets financial activities, such as settlement systems and payment systems, through tax incentives, reductions or even financial subsidies, or through government purchases. The second is to establish and improve the regulatory norms and relevant supporting institutional measures required by the development of Internet finance. First, specify the regulatory authority, or regulate the access mechanism, responsibility and rights, exit mechanism, and punishment mechanism for misconduct of Internet financial traders by industry organizations through authorization. The second is to establish legal norms, laws and regulations, regulatory rules, industry standards, credit systems, guarantee systems, accounting rules, to ensure and regulate the development of Internet finance.

Strengthen the publicity, guidance, and skills training of agricultural crowdfunding. Farmers who run family farms usually lack knowledge of emerging Internet technologies and Internet finance. Therefore, in the early stage of the development of agricultural crowdfunding, the crowdfunding platform, and local governments should strengthen the publicity of agricultural crowdfunding, popularize the relevant knowledge of Internet finance, and use local government agricultural support training programs and other ways to cooperate with local governments through agricultural crowdfunding platforms or Internet e-commerce platforms. The training content should include at least two aspects: first, Internet-related knowledge and skills training in the application of Internet finance, the design of crowdfunding projects, the use of platform communication and performance; Second, training in economic management, agricultural technology, science and culture, and relevant economic laws.

Improve the family farm's awareness of Internet finance and integrity. Many family farmers evolved from traditional farmers. They have rich experience in agricultural production and are experts in planting and breeding. However, their financial awareness is relatively conservative and backward. Affected by the deteriorating rural credit environment in recent years, some farmers have no sense of trust in Internet finance and lack a sufficient sense of integrity. At present, it may be difficult to change the above situation only depending on the strength of family farmers. It is necessary to cultivate family farmers' moderate awareness of Internet finance and integrity and improve their own development ability and level with the help of external forces, including lectures on the connotation and application of Internet finance held by the government; The government and society should expand the social credit system, incorporate the credit of family farms into the social credit system, and regard it as the public responsibility of the government, and provide it to the society for free, so as to urge them to improve their sense of integrity.

Do a good job in risk management and reduce project implementation risks. During the implementation of agricultural crowdfunding, financing platforms, fundraisers and investors face different risks. How to achieve the minimum cost to obtain the maximum benefit guarantee and do a good job in risk management will be the main problem for the

benign development of agricultural crowdfunding. The basic way to solve the risk is to improve their risk management ability and do a good job in risk transfer. First, the construction of family farms, crowdfunding platforms, and investors themselves is the premise and guarantee for the sustainable development of agricultural crowdfunding. The financiers, investors, and crowdfunding platforms of agricultural crowdfunding should establish a modern enterprise management system with clear property rights, flexible mechanisms, and standardized operation as soon as possible; Establish a standardized internal control system, improve the financial and accounting system, gradually establish a modern management information system, and do a good job in the basic connection with Internet finance. Second, through appropriate financial subsidies, agricultural insurance companies are encouraged to expand the coverage and contracting scope of agricultural insurance. For example, real estate, facility housing, greenhouse, and agricultural machinery should be included in the agricultural insurance coverage to reduce the risk of agricultural production and reduce the risk of crowdfunding.

Innovate the form of crowdfunding and promote the sustainable and healthy development of agricultural crowdfunding. In the case of large financing scale, pre-purchase crowdfunding of agricultural products can be combined with creditor's rights crowdfunding. For example, in the financing implementation process of large-scale family farms, crowdfunding can be initiated to raise large-scale funds. The principal is repaid in cash, and the proceeds can be compensated through agricultural products to achieve financing that exceeds the value of agricultural products. According to this idea, we can design innovative models such as "agricultural product crowdfunding+equity crowdfunding," "agricultural product crowdfunding+bond crowdfunding," and "equity crowdfunding+bond crowdfunding." The crowdfunding of agricultural products pre-purchase itself should do a good job in market segmentation and achieve the combination of high-end niche and inclusive public. With the continuous improvement of people's living standards, the demand for products and services is increasingly diversified. Family farms and crowdfunding platforms should innovate in the market segmentation positioning of products and financing operation methods. Meet the diversified needs of consumers and investors, which will contribute to the diversity of household agricultural

product production and marketing and the diversification of profit models, and promote the sustainable development of agricultural crowdfunding financing platforms.

Conclusions to section 3

Through the third section, family farm management system tools of analysis and research, from the factors affecting the development of the family farm management, according to the weights of affecting factors, family farmers' quality plays an essential role in the development of the family farm management, family farmers to new professional farmers development is a must request, will be the "double teacher" training system, the introduction of campus, Better service for family farmers. Family farm sales of agricultural products are the primary source of increased income for family farms. Analyze the current situation and reasons affecting the sales of farm products in family farms, put forward suggestions, and carry out the practice. At the same time, the current financing situation of family farms is analyzed, and crowdfunding and other ways are proposed to provide financial support for developing family farms. Through the third part of the study, the following conclusions are drawn:

1. To study the process of cultivating a new type of professional family farm farmer, this dissertation defines "new professional farmers - family farmers" in terms of theoretical definition. The author thinks that the new-type professional farmers in the field of agriculture should have the quality of high-tech culture, master professional agricultural production skills, prepare modern consciousness and management ability, and be able to take risks in agricultural production, management, and service work. The new type of family farmer is characterized by "high culture, technical knowledge, business knowledge, policy understanding, organization and law-abiding." At the same time, the cultivation of new family farmers is explained. The cultivation of new-type professional farmers is sufficient to make ordinary farmers become new-type professional farmers through various cultivation approaches and methods.

2. According to the training survey results, the current training content does not match their actual needs. The number of people who believe that the current training has the problem of "stale content" and "the teacher is not vivid" is relatively small (14% and 5% respectively). Less practice, less visit and learning, and less self-study content are also the reasons for the reduced effect of modern agricultural management comprehensive quality training for new family farmers. Family farmers are most willing to train five or six times a year. The most popular trainers for farmers are rural agricultural technicians, who prefer "theory + practice" trainers. The education and training contents most needed by family farmers are practical agricultural technology, agricultural product market information, and marketing. Through the "Modern agricultural training system for Family farmers," the "double teacher" teaching mode is implemented. Compared with the traditional cultivation mode, it is more accurate and personalized and combines theory with practice to improve the cultivation quality of family farmers.

3. Under the environment of the economy entering the new normal, the new system "Internet + agricultural product marketing" formed by the combination of "Internet +" and "agricultural product marketing" has changed the traditional marketing methods of agricultural products. Compared with conventional agricultural product marketing, the "Internet + agricultural product marketing" system reduces the cost of agricultural product marketing, realizes the information symmetry between the two sides, establishes the brand, expands the domestic and foreign markets, and improves the quality of marketing services. At the same time, the "Internet + agricultural product marketing" system has a far-reaching impact on agricultural modernization, which accelerates the pace of modern agricultural industrialization, promotes the process of modern agricultural informatization, and enhances the competitiveness of the agricultural products market. According to the data, among the marketing channels of family farms' agricultural products, traditional spot trading channels are still the mainstream sales channels of family farms. Among all the eight sales channels, Internet platform channels account for 9.40%, ranking seventh place. Due to the factors of consciousness, facilities, and environment, there is no perfect ability to explore the potential of the Internet.

4. The main purpose of family farm product marketing is to improve economic and social benefits for the family farm in the shortest time. At the same time, efficient family farm product sales management is also an important link in the management process of family farm development, which can better improve the management process of family farm development. As for the innovation and selection of farm product management channels. Improve the overall quality of farmers, and the training of new farmers should be carried out. Strengthen household agricultural product brand building through multiple channels. Agricultural modernization needs a lot of financial support. Government departments should increase agricultural subsidies, and special funds will be tilted toward family farms. Expand the sales channels of family farms, and use "Internet +" to open up the production and marketing of agricultural products through mobile e-commerce. Signed an agricultural product + "Wechat Group" sales agreement with "Nongle" Family Farm, increasing the income by 260,000 yuan since 2020.

5. Family farms have increasingly strong demand and dependence on funds. Due to high risk, long cycle, and lack of fixed assets in agricultural production, it is not easy to meet the conditions of bank loans. Financial institutions often set up complex risk management procedures, such as mortgages, pledges, and third-party guarantees. Financial institutions have been wary of the demand for loans from family farms, even refusing to grant them. Therefore, must find a new financing mode, to solve the problem of family farm financing.

6. As a new financing mode, crowdfunding has been accepted by most family farmers because of its low risk, high information, low threshold, and fewer procedures compared with traditional financing channels. At present, Internet crowdfunding develops rapidly, and investors like this kind of financing method. The combination of family farms and crowdfunding can promote business expansion and enhance the influence of crowdfunding platforms. At the same time, it can also expand the sales channels of family farms to solve the financing difficulties of family farms. The crowdfunding model will provide new opportunities and impetus for the development of family farms. At the same time, we should also understand that crowdfunding is not a

panacea. As a new agricultural development model, family farms may also encounter disadvantages brought by financing while enjoying the convenience of crowdfunding.

7. For the development of family farms, agricultural science, and technology innovation is the key. The crowdfunding model requires family farms to introduce their own products in multiple ways comprehensively optimize their own production and operation system, and promote technological innovation and development. The application of the family farm crowdfunding model can integrate the resources needed by the agricultural industry chain. At the same time, it is necessary to strengthen the publicity, guidance, and skill training of agricultural crowdfunding. Improve the awareness of Internet finance and the integrity of family farms. Do a good job in risk management and reduce project implementation risks. We will innovate crowdfunding forms and boost the sustainable and healthy development of agricultural crowdfunding. Improve the management process of family farm development.

CONCLUSIONS

This dissertation starts from the theory, Improves the definition of the family farms in China, finds out the characteristics of the development and management of the family farms in the world, and analyzes the economic aspects of the formation process of the family farms in China. Through the empirical study, find out the management influencing factors of family farm development. Family farm management is not only an aspect of action. It is a process; the whole process includes many aspects, the author, according to weight according to the influencing factors of informationization, the family farmland circulation respectively, the farmer quality, construction, and agricultural products marketing channel innovation, then explores its family farm financing, Suggestions for the development of the family farm management and strategy, At the same time, practice, perfect the management process of family farm development. According to the research of the whole article, the following conclusions are drawn.

1. Through literature analysis and research on the family farm, according to China's current policy and current situation, put forward the "family farm" definition to improve the previous description, defines the family farm as labor mainly for family members, with agricultural income as the primary labor income, for the further study of Chinese family farm, provides the concept research scope and standards. At the same time, the need for the appropriate land scale of specialization, commercialization, intensive production form, the conditions for economic transformation, and the development of the family farm management provides the research goal and the direction for the articles. It provides the basis and reference for the reasonable definition of "family farm" under the background of economic transformation, and provides the basis for the study of the management process of the development of family farm in China.

2. In traditional financial activities, financial institutions usually set up complicated risk management procedures such as a mortgage, pledges, and third-party guarantees to ensure the recovery of loans. At the same time, the unit financing cost of family farms is relatively high due to the small amount of financing. Therefore, financial institutions are cautious about the loan demand of family farms and even refuse to grant loans. At the

same time, family farms may not prioritize traditional bank credit because of higher costs and red tape. Through empirical analysis, the factors affecting the financing of family farms, in turn, are as follows: whether there are mortgaged assets, annual average profit, whether the financial management of family farms is standardized, whether there are registered trademarks, whether agricultural insurance has been purchased, credit records, and whether the family farm support policies are met. Therefore, to solve the financing problem of family farms, we must innovate the financing mode. With the deepening application of Internet technology, Internet finance based on the Internet spirit -- "openness, equality, collaboration, and sharing" may be a new option, and agricultural crowdfunding is a critical path.

3. Due to the long agricultural cycle, high risk, and the need to expand the scale of production, family farms need funds as the basis. In today's era, with the prevalence of the Internet, crowdfunding is accepted by everyone. By taking advantage of the openness of the Internet, the information of both parties of crowdfunding is made public to facilitate access to each other's information. Compared with traditional loans, need a lot of early accumulation of material, crowdfunding relative requirements low, the project or agricultural products through propaganda to investors, feel appreciated, often can be successful financing, at the same time, according to the target on the premise of ensuring that sales, family farms according to the order for production, the risk is low. The crowdfunding platform conducts crowdfunding according to investors' love for the project. After the funds are collected, they are placed in government or third-party regulatory accounts to ensure the security of interests. The implementation of crowdfunding not only expands the sales channels of agricultural products and increases income but also solves the demand for funds for family farms, provides development impetus for family farms, and improves the management process of family farms' development.

4. According to the results of the current family farmer training survey, it can be concluded that only 20% of farmers feel that the current training is ineffective. The main reasons affecting the training effect are less practice and less visit and study. From the point of training time, should steer clear of agricultural production, the most appropriate

training time should be 3 to 7 days, training should be 5 to 6 times a year, The training should be conducted in a place with convenient transportation. For the selection of training teachers, teachers with a balance between theoretical and operational abilities should be selected to improve teaching efficiency. The training content should be inclined to technology, agricultural product processing, sales, policies, and regulations. It can be seen that due to the influence of traditional concepts, current Chinese family farmers actively participate in the training of consciousness is relatively weak, training in the form of a single, most of them take place in a classroom, the lack combined with practice training content without a specific aim, content, the object of government support is not comprehensive, the lack of evaluation of training effect mechanism. It affects the training effect of family farmers. It is very important to improve the training awareness of farmers, promote the flow of information, establish an assessment mechanism, combine schools, research institutes, and agricultural experts with improving the diversity of education and training, innovating the training mode of family farmers, and improve the training efficiency.

5. Put forward the "modern agricultural training system for family farmers" and carry out the "double teacher" teaching model, which is more accurate and personalized and combines theory with practice to improve the cultivation quality of family farmers. School of Agronomy and Horticulture, Jiangsu Agricultural Vocational College, using the training system of "Double Teachers" Family farmers. From January 1, 2022, to now, 5 sessions of "new family Farmer training" have been carried out, covering 82 sub-sessions and training more than 2,300 new family farmers. It improves the scientific and cultural quality of family farmers, grasps the professional agricultural production skills, has the modern consciousness and the management ability, and can bear the farm production, the management, or the service risk ability.

6. Efficient management of family farm product sales is also an essential link in the management process of family farm development, which can improve the management process of family farm development. The results show that the most important sales channels of family farm products are selling to consumers, purchasing by enterprises, and selling to big sellers, accounting for 17.3%, 15.3%, and 15.2%,

respectively. The brand and certification of family farm produce, the form of operation, and the degree of understanding of Internet sales have a significant influence on the choice of the sales channel. According to the result analysis, the "Internet + agricultural product marketing" system has a profound impact on agricultural modernization. It can accelerate the pace of modern agricultural industrialization, promote the process of modern agricultural informatization, and enhance the competitiveness of the agricultural products market. However, the current sales of Chinese family farms are still dominated by traditional channels. Among all the eight sales channels, Internet sales rank 7th, accounting for 9.4%. That family farmers have not been integrated into the great profits brought by "Internet Plus" in the process of managing the development of family farms.

7. Agricultural land is the basic condition for the formation of family farms. However, due to China's large population and small land, the lack of agricultural land is an important factor affecting the development and management of family farms in China. Land transfer is an important way for family farms to achieve scale land, intensification, and technology. In 2020, China transferred 35.4798 million hectares of land, an increase of 4.3 percent over the previous year. It is very important to implement the marketization mechanism of rural land transfer. It can achieve the best allocation of land resources, avoid the waste of land resources, is conducive to capital into the rural areas, improve the efficiency of agricultural production, further set up, including agricultural land ownership, rights, and financial markets, the complete market system, increase the propaganda dynamics, promotes the land in accordance with the law, standardize the land circulation, improve the land intermediary market service system, Give full play to the role of market mechanism to provide the necessary land foundation for the intensive, large-scale and technological production of family farm.

8. "Nongle" family farm produce + Internet sales contracts, the agricultural products + "WeChat group of" sales model, broaden the indications of farm products sales channels, at the same time, it reduces the cost of workforce and material resources in the traditional sales model, price is often lower than the market price, customers get preferential treatment, increasing the income of the family farm. This project was approved by the WeChat Business Association of Xinxiang City, Henan Province. With

the original sales channels retained, agricultural products were sold in the "WeChat group," with a sales volume of 310,000 RMB and a net profit of 72,000 RMB in 2020. In 2021, the sales volume was 380,000 RMB, and the net profit was 106,000 RMB. Since January 2022.01, we had 82 kinds of products together and sold about 2000 pieces of goods, with a sales volume of up to 320,000 RMB and a net profit of 80,000 RMB. We have provided channels for family farm agricultural products and increased the sales of family farm agricultural products.

9. Taking "informatization" as an essential indicator in the development and management of family farms, the help of existing information on family farms is mainly concentrated on the production side. 28% of the respondents think that agricultural technical information plays the most significant role, followed by epidemic disease (24%), market supply and demand (17%), and production and management (15%). At the same time, market supply and demand information was the most urgent need for family farms (28.15%), followed by agricultural technology extension information (23.35%) and epidemic disease information (13.48%). At the same time, through the "multi-level family farm development management system," find out the root of China's family farm development management problems from many aspects to improve the management process of family farm development. According to the research, the management of family farm development in China is not one aspect but the control of the whole development process. It is necessary to conduct in-depth research on information construction, land transfer, family farmer education, marketing channel innovation, and financing channel expansion. It is starting from the definition of the content, collating the literature, conducting empirical analysis, finding out the problems, discussing the results, and putting forward innovative and improved development management methods and strategies. Improve the management process of whole family farm development from many aspects and profound levels.

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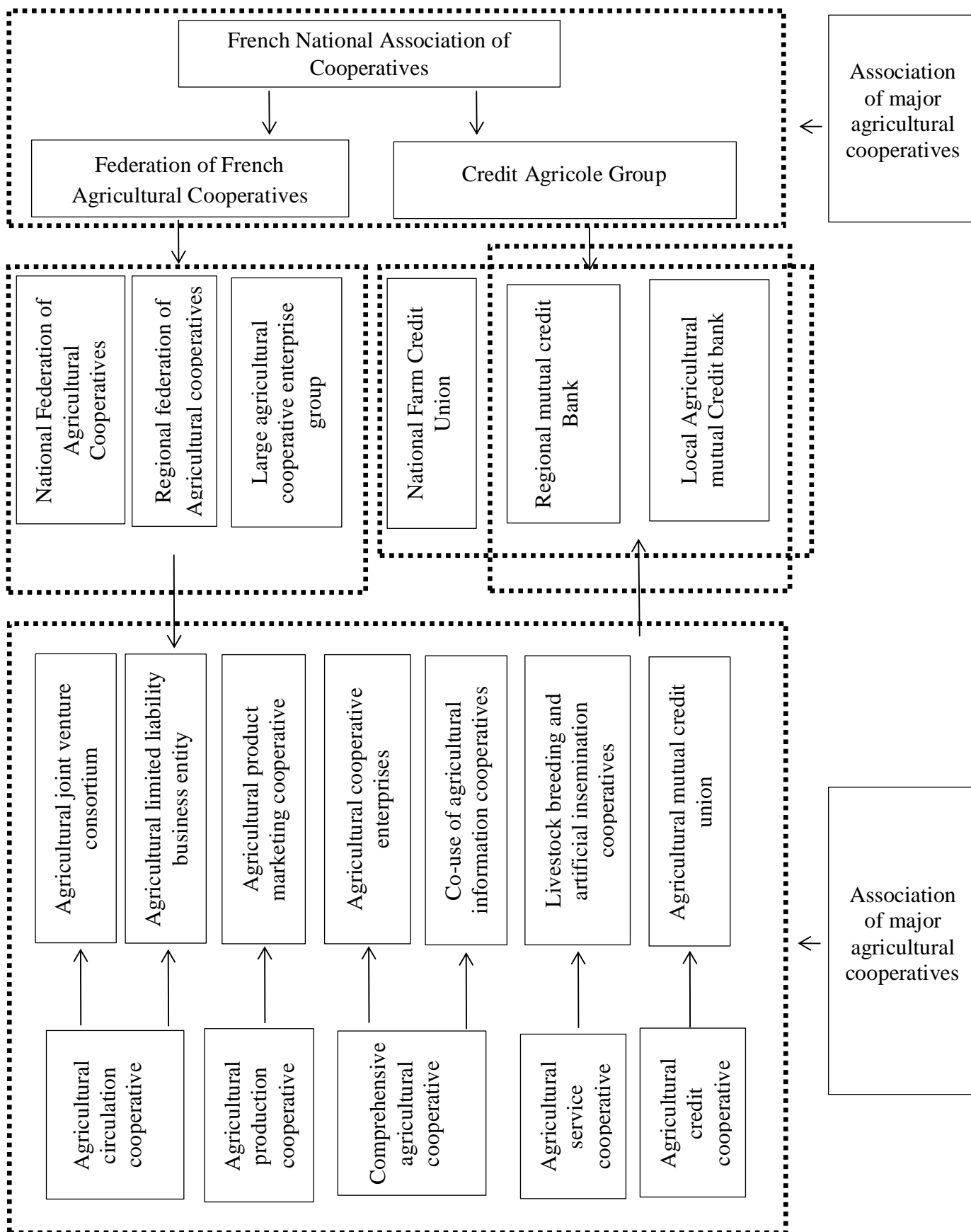
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APPENDICES

Organization and management system of French agricultural cooperatives



Questionnaire on Family Farm Development Management

Dear family farmers:

Hello! In order to further improve the training effect of modern management training for new family farmers in China, we are conducting a questionnaire survey and hope to get your support. This questionnaire will be filled in anonymously. We promise that the information obtained will only be used for academic research.

Thank you for your support.

1. Your gender is () and your age is (____).
A. Male B. female
2. Your education period is () years.
A. Primary school B. junior high school C. senior high school
D. junior college E. bachelor degree or above
3. The number of labor force in your family is ().
A.1-3 B.4-5 C.More than 5
4. Your family farm has been established for () years.
A. 1-3 B.4-6 C.9-12 D. more than 12 years
5. The number of workers employed by your family farm for a long time is ().
A.1-3 B.4-5 C.More than 5
6. Is your family farm registered ()
A. yes B. No. How much is the registered capital of your family farm (____).
7. Your family farm management form is ().
A. Individual business B. sole proprietorship C. partnership
D. company E. general family business(unregistered)
8. Investment amount of family farm().

- A. Below 50000 RMB B.50001-100000 RMB C.100001-200000 RMB
 D.200001-500000 RMB E.500001 -1000000 RMB F.More than 1000000 RMB
- 9.Total income of family farm operation in the one year().
 A.Below 100000 RMB B.100001-500000 RMB C.500001-1000000 RMB
 D.1000001-2000000 RMB E.More than 2000000 RMB
10. The proportion of your family farm's own funds is (%).
- 11 The operating area of family farm is (). (mu is Chinese unit of area,equal to 1/15 of a hectare or 1/6 an acre.)
 A. Below10 mu B.11-100 mu C.101-500 mu
 D. 501-1000 mu E.1001-1500 mu F.More than 1500 mu
12. The land transfer period of your family farm is () years.
 A. Less than 5 years B. 5-10 years C. 11-15 years
 D. 16-20 years E. more than 20 years
13. Farmer's reputation in the local area().
 A. Very good B. good C. average D. poor
14. The relationship between the farm and the local villagers().
 A. Very close B. close C. general D. distant
15. Do you have any personal or family farm loan experience ().
 A. yes B. No
16. Have you ever made a credit rating personally().
 A. Yes B. No
- 17.The main source of funds for your family farm operation is ().
 A. Self raised fund B. bank loan fund C. financial support fund
 D. external investment fund E. private loan
18. Has your family farm needed money recently ().
 A. yes B. No
19. Your capital demand is less than ().
 A.20000 RMB B. 20001-50000 RMB C. 50001-100000 RMB
 D. 100001-200000 RMB E. 200001-500000 RMB F. More than 500000RMB

20. The loan term you need ().
- A. Less than 1 year B.1-3 years C.3-5 years D.5-10 years E.more than 10 years
21. The purpose of your family farm loan is ().
- A. Land transfer and facilities construction B. purchase of mechanical tools and equipment C. purchase of seeds and seedlings D. expenditure on fertilizers and pesticides
- 22.Do you have social relations with financial institutions and the government().
- A.Yes B. No
23. Are you a village cadre().
- A.Yes B. No
24. Have you registered the trademark of agricultural products().
- A.Yes B. No
25. Whether the family farm has a complete income and expenditure record (), if so, the income and expenditure record work is undertaken by ().
- A. Yes, the farmer himself. B yes, other family members
C. yes, employ financial professionals D. no
26. Does your family farm have agricultural insurance().
- A.Yes B. No
27. Agricultural insurance cost input ().
- A. Below 200 RMB B.200-500 RMB C.501-1000 RMB
D.1001-2000 RMB E.2001-5000 RMB F.More than 5000 RMB
28. Are agricultural subsidies available().
- A.Yes B. No
29. Is your family farm mortgaged or guaranteed by others ().
- A.Yes B. No
30. Do you have any bad credit history().
- A.Yes B. No
- 31.Are you related to the relevant agricultural enterprises and professional cooperatives?().
- A. never B. occasionally C. often

32. Whether the family farm is a demonstration farm ().

- A. provincial demonstration farm
- B. municipal demonstration farm
- C. district and county level demonstration farm
- D. non demonstration farm

33. The credit enhancement methods that family farm financing can provide are as follows. [multiple choice questions] ().

- A. commercial housing and residential land mortgage
- B. self owned land use right pledge
- C. circulation land management right pledge
- D. planting and breeding mortgage
- E. machinery and equipment or transportation vehicle mortgage
- F. guarantee company, cooperative and other production and operation organization guarantee
- G. agricultural insurance
- H. others, please explain_____

34. The main reason for the difficulty of family farm loan is (). [multiple choice questions]

- A. weak quality of agricultural production
- B. lack of effective mortgage and pledge guarantee conditions for family farms
- C. insufficient strength and precision of financial support policies
- D. uneven quality of farmers and difficulty in guaranteeing repayment willingness
- E. others, please explain_____

**Questionnaire survey on
training needs of new family farmers**

Dear family farmers:

Hello! In order to further improve the training effect of modern management training for new family farmers in China, we are conducting a questionnaire survey and hope to get your support. This questionnaire will be filled in anonymously. We promise that the information obtained will only be used for academic research.

Thank you for your support!

1. Your gender is: A. Male B. Female
2. Your age is. A. Under 25 years old B.26-35 years old, C.36-45 years old, D.46-55 years old, E.56-65 years old, F.66 years old and above
3. Your education background is. A. Primary school education and below. B. Junior high school education. C. High school or technical secondary school education. D. Junior college education. E. Bachelor degree and above
4. Your main industry is: [multiple choice]. A. Planting industry. B. Breeding industry. C. Fisheries. D.Agricultural service industry. E. Agricultural product marketing. F. Agricultural product processing and storage. G. Leisure agriculture. H. others
5. How many years have you been engaged in agricultural production and operation?. A.5 years or less, B.5-10 years, C.11-15 years, D. 16-20 years, E.21-25 years, and F.25 years or more
6. Number of your family members. A. 1 B.2 C.3 D.4 E.5 F.6 G.7 H.8 above
7. Number of people engaged in agricultural production in your family. A. 1 B.2 C.3 D.4 E.5 F.6 G.7 H.8 above
8. Your family's annual net agricultural income in 2019:

A. Less than 10000 yuan B. 10000 yuan to 20000 yuan C. 20000 yuan to 40000 yuan D. 40000 yuan to 60000 yuan E. 60000 yuan or more

9. The sources of agricultural knowledge and technology you currently apply are mainly (the first three items): [multiple choice questions]. A. Training organized by agricultural and rural departments. B. Agricultural technology promotion departments. C. Cooperative organizations, professional associations. D. Enterprises. E. Television. F. Internet. G. Newspapers, magazines, books. H. Neighbours and friends. I. Others

10. Are you willing to participate in academic education?

A. Yes B. No

11. What factors affect your participation in academic education? . A. In conflict with production and operation, he is worried that there is no time. B. Too far away, there is a lack of local education and training institutions. C. No education institution to organize. D. Useless and impractical. E. Low in teachers' level. F. Not high in educational level. G. High in educational expenses. H. Others

12. Are you willing to participate in the training courses for farmers every year?

A. Yes B. No

13. If the teaching and training time conflicts with your production and operation time, what is your choice?

A. Teaching and training B. Production and operation activities

14. The length of one-time continuous training you are most willing to accept is:
A. 1 day B. 2 days C. 3 days D. 4-7 days E. 8-10 days F. 11 days or more

15. The cumulative training time in a year that you are willing to accept is.

A. 2 days, B. 3 days, C. 4 to 6 days, D. 7 to 10 days, E. 11 to 15 days, F. others

16. Where would you like to receive education and training?

A big city. B county. C Township. D. Home village. E. If you can provide transportation services, you can go to a far place

17. What kind of teachers do you like most when you attend the training? [Multiple choice questions]. A. Senior experts or professors from scientific research institutions and colleges and universities. B. County and township agricultural technicians close

to the production line. C. Village experts and local experts. D. Experts from government departments. E. Others

18. The types of education and training you are willing to accept are: [multiple choices]. A. Practical technology training. B. Vocational skills training. C. E-commerce training for agricultural products. D. Training for leaders of new agricultural operation subjects. E. Training for modern young family farmers. F. Comprehensive management training for agricultural enterprises. G. Processing and marketing of agricultural products. H. Entrepreneurship training. I. Academic education

19. The training forms you like are: [multiple choice questions]. A. face-to-face teaching (classroom concentration). B. on-site practice (field school). C. television, network, mobile phone (distance teaching). D. visit and investigation. E. teacher's follow-up and guidance. F. Others

20. What education and training content do you need? [Multi choice questions]: A. Practical agricultural technology (planting, aquaculture, fishery). B. Agricultural product market information, marketing. C. Agricultural product processing, storage, transportation service technology. D. Employment and entrepreneurship skills training. E. Industrial situation and related policy training. . Business management and legal knowledge

21. The main purposes for you to participate in the farmer training are: [multiple choices]. A. to improve skills. B. to obtain information about the market, science and technology. C. to obtain policy support. D. to increase income. E. to obtain relevant certificates. F. to have leisure

22. Do you think the farmer training you have attended has any effect on the industrial development you are engaged in?

A. Very effective. B. Average effect. C. No effect

23. In your opinion, the main problems in the current farmers' education and training are: [multiple choice questions]. A. Too short time. B. Too long time. C. Inconvenient transportation. D. Outdated lecture content. E. The content is not in

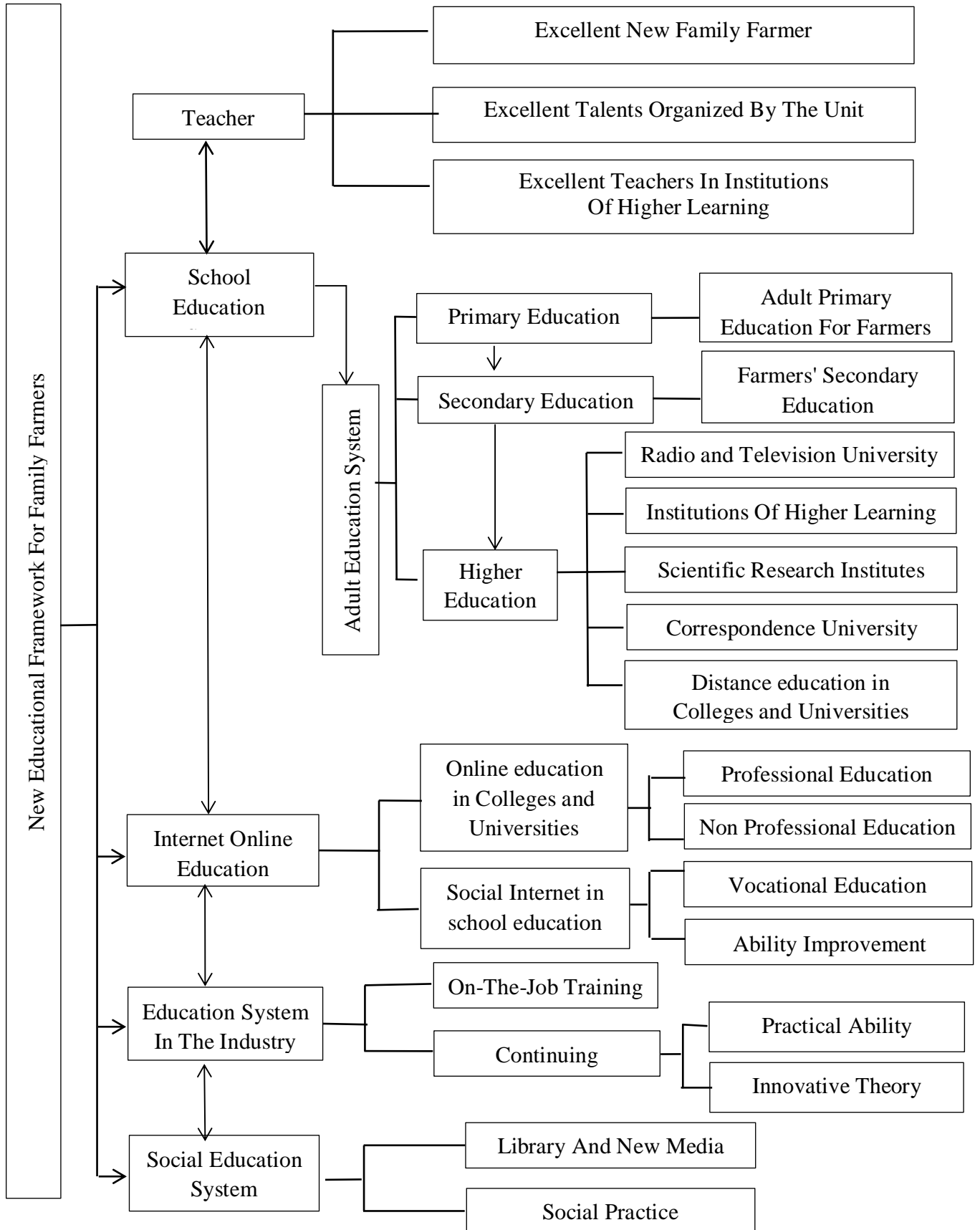
line with my actual situation. F. The teacher's lecture is not vivid. G. The time conflict with my production and operation activities

24. What are the main factors preventing you from receiving farmer education and training [Multi choice questions]. A. Conflicting with production and operation, no time. B. Inconvenient traffic at the school location. C. The content is useless, impractical. D. The teacher's lecture is not attractive. E. The practice is too little. F. The visit is too little. G. The content of self learning through mobile phones or the Internet is too little

25. In your opinion, the main factors restricting the development of your industrial production and operation are: [multiple choices]. A. Lack of labor force. B. Lack of professional and technical knowledge. C. Lack of market sales. D. Lack of government policy support. E. Lack of funds. F. Own age, physical strength can not keep up with. G. Lack of portable and practical equipment. H. Other skills

26. What do you expect the agricultural and rural departments to do in farmer education and training? [Multi choice questions]. A. Focusing on the development of local agriculture, organize farmers to participate in training free of charge. B. Township and village organizations provide training information, and farmers can freely choose to participate in training. C. Listen to farmers' opinions, develop targeted training plans, training methods. D. Class should be lively, Attractive. E. Increase the time for visiting, studying and practicing. F. Increase the time for experts to follow up. G. Combine farmer training and academic education. H. Other

New family farmer education framework



“Double Teacher” teaching system certificate

“Double teacher” teaching system certificate

"Double Teacher" teaching system refers to the combination of online and offline teaching based on "Internet" technology. Professional teachers teach online in real time, and offline assistants provide targeted guidance and teaching on local websites. The dual class class solves the problem of teacher shortage and instability in the new family farmer education and training system. At the same time, it makes possible the authorization of the Internet and high-tech equipment, and makes innovative learning possible. This model can stimulate the learning interest of new family farmers and improve the learning effect. It maximizes the offline teaching scene and caters to farmers' learning habits. Introduce teaching feedback optimization. Improve the teaching ability of teachers, and test the learning results of new family farmers in the form of lectures and examinations. It improves the teaching quality and learning efficiency, solves the teaching mode of shortage of high-quality teachers and low learning efficiency, and promotes the improvement of the comprehensive quality of new farmers.

In order to better distribute excellent teacher resources to the whole country, after analysis and consideration, the school adopted the "Double Teacher" training system. From January 1, 2022 to now, a total of 82 sessions of 5 sessions of "new family farmer training" have been carried out, training more than 2,300 new family farmers. Niu Lichen has participated in the formulation of the "Double Teacher" teaching system and participated in the actual teaching. Through the training of family farmers, the scientific and cultural quality of family farmers has been improved, and they have mastered agricultural professional production skills, modern awareness and management ability, and have the ability to resist the risks of agricultural production, operation or service.



School of Agronomy and Horticulture
Jiangsu Agricultural Vocational College

2021.12.10

"WeChat" group purchase plan and contract

"Wechat" group purchase plan and contract

Party A: POP Group Purchase vip group
Address: 259 Jianshe East, Muye District, Xinxiang City, Henan Province
Telephone: 15637399820

Party B: (supplier) Nongle Family Farm
Address: Xinchang Line and Jing16 Road, Xinxiang City, Henan Province
Telephone: 15637300692

In order to ensure the cooperation and win-win of wechat group buying project, Party A and Party B, through friendly negotiation, hereby reach the following agreement regarding cooperation matters:

Item 1. Party B's qualification for cooperation

1.1 Products Supplied shall mean the products manufactured or distributed by Party B with complete quality inspection and authorization qualifications and qualified quality.

1.2 Party B shall have a physical family farm and operate it normally.

1.3 Party B shall have technical personnel for agricultural products and the ability to solve after-sales problems.

1.4 Party B shall guarantee the normal supply of group purchase products and provide common accessories or stock replenishment to group purchase members.

Item 2. Term of Cooperation

2.1 From January 1, 2022 to December 31, 2022.

Item 3 Content of cooperation

3.1 Commodities to be provided by Party B shall be determined through consultation with Party A.

3.2 Party A and Party B shall sell agricultural products through wechat promotion and Solillion group purchase. Promotion service fee is RMB/month. Party A promotes the group purchase products for Party B in the wechat community every month. After the sales, Party A shall transfer the payment to Party B (after settlement and sharing), and Party B shall be responsible for distributing the products to the group purchase members.

Item 4. Party A's Responsibilities

4.1 Party A shall promote the products in the community according to the agreement and the product marketing materials provided by Party B.

4.2 Party A shall not publish products of other merchants of the same brand with Party B at the same time for each community promotion.

4.3 Party A shall timely inform Party B of the feedback of group purchase members on Party B's products in the community.

Item 5. Responsibilities of Party B

5.1 The product information provided by Party B must be true and legal. In case of any false, exaggerated or deceptive situation, Party B shall be liable for any losses caused thereby.

5.2 The products provided by Party B must comply with the relevant provisions of the Product Quality Law. Party B shall be responsible for all liabilities caused by quality problems of the products purchased by consumers after purchase.

5.3 Party B shall provide Party A with product pictures, price lists and other related technical parameters, marketing and other auxiliary materials.

This Contract is made in duplicate, with each party holding one copy and each copy having the same legal effect. For matters not covered herein, Party A and Party B may sign a supplementary agreement through negotiation. This agreement shall come into force upon signature by both parties. If either party breaches the contract, it shall be liable for breach of contract. The non-breaching party shall have the right to terminate this Agreement and demand the breaching party to compensate for economic losses. The amount of compensation shall be subject to the actual economic losses. If the agreement can be reached, a suit may be brought to the local people's court.

Party A: (Signature or seal)

Hu Lichen

Party B: (Signature or seal)

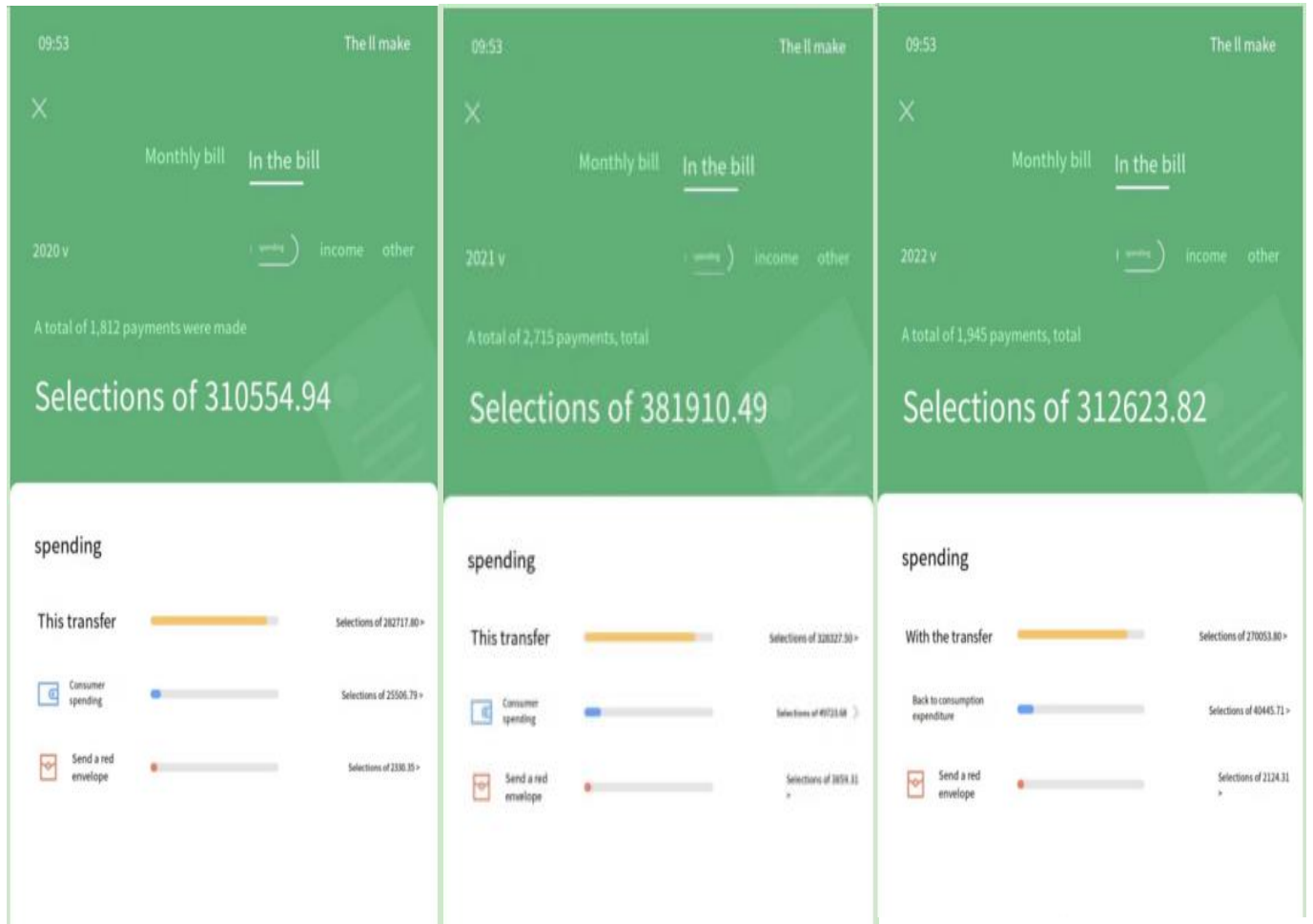
wang x'in Hua



Date: *2021.12.20*

Date: *2021.12.20*

WeChat group purchase group transfer record



Implementaion of WeChat shopping group

Wechat shopping group

"Nongle" family farm agricultural products sales, or traditional sales model, mainly to wholesalers and markets. By reference, the family farm produce + "wechat group" sales model created by Niu Li Chen has broadened the sales channels of agricultural products and increased the income of family farms. This project was approved by the wechat Business Association of Xinxiang City, Henan Province, project application No. : 4120200215, and was approved on January 1, 2020.

Through agricultural products + "WeChat group" sales model, make agricultural products can be according to the order for production and sales, compared with the traditional market, can increase the consumption quantity of agricultural products, at the same time, compared to sell to wholesalers have some increase in price, according to farm income statistics, in the case of the original sales channel sales, use of agricultural products sold in "WeChat group", In 2020, the sales volume was 310,000 RMB, and the net profit was 72,000 RMB. In 2021, the sales volume was 380,000 RMB, and the net profit was 106,000 RMB. Since January, 2022.01, we have sold 82 kinds of products together and sold about 2000 pieces of goods, with a sales volume of up to 320,000 RMB and a net profit of 80,000 RMB. We have provided channels for the sales of family farm agricultural products and increased the sales of family farm agricultural products.



"Nongle" family farm
 Representative: *Wang Chen* *here*

