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Organic Connection between Small Farmers and Modern Agriculture Development Based on Farmers' Cooperatives in China

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Abstract As socialism with Chinese characteristics enters a new era, China's agricultural and rural development has also made remarkable achievements. However, the shortcomings of modernization are still in the field of agriculture, rural areas and farmers. The report of the 19th National Congress of the Communist Party of China proposes a strategy of rural revitalization. It is pointed out that the organic connection between small farmers and modern agricultural development should be promoted. In the development of modern agriculture, small farmers face the problems of scattered production factors, aging labor force and low labor quality, low industrialization, and low market position. This paper compares the characteristics of farmer cooperatives with other new business entities. Combined with the relevant contents of the *Law of the People's Republic of China on Farmers' Professional Cooperatives* newly revised in 2017, this paper analyzes the organizational, service, and intermediary functions of farmers' cooperatives to promote the organic connection between small farmers and modern agriculture development and reveals the role of farmers' cooperatives in China's agricultural development.

Key words Modern agriculture, Farmers' cooperative, Small farmers, New agricultural operator

1 Introduction

Realizing the organic connection between small farmers and modern agricultural development is an important part of establishing a modern agricultural management system, and also the main point of realizing agricultural modernization. Moderate scale operation is the only way for modern agriculture. But in the construction of modern agriculture, we must combine the current situation of agricultural development in China, have a clear understanding, and follow a reasonable development approach. Small farmers are still the main operators of agriculture in China. How to bring small farmers into the development track of modern agriculture reasonably and effectively is particularly important. Data from China's third agricultural census showed that there were 207 million farmers in China; among agricultural operators, the proportion of small farmers was higher than 98%; small farmers accounted for 90% of agricultural employees; and the area of cultivated land operated by small farmers accounted for 70% of the total cultivated land area. The foundation of small farmers is weak, and it is difficult to achieve organic connection with modern agriculture by small farmers alone. There were about 1.933 million farmers' professional

cooperatives in China, with more than 100 million farmer households. The coverage of cooperatives had been further expanded, gradually integrating into the primary, secondary and tertiary industries, and the level of cooperation had been enhanced. The total value of services reached 1 104.4 billion yuan^[1]. In coordinating the process of cultivating new agricultural operators and supporting small farmers, farmers' cooperatives should also give play to their advantages to serve small farmers.

Small farmers refer to the agricultural micro-subjects that take the family as a unit and integrate production and consumption as a result of endowment of more people and less land^[2]. There are differences between "small farmer" and "small farmer household". In the conceptual nature, "small farmer" is dialectics of "qualitative prescriptiveness" (subject composition and land ownership) and "quantitative prescriptiveness" (land scale and living standards), while "small farmer household" is an independent reflection of the "quantity prescriptiveness" of the concept of "small farmer", and is a synthetic unit that can perform independent economic accounting^[3]. The basic characteristics of modern agriculture are reflected in intensive factors, large-scale production, diversified functions and artificial intelligence^[4]. Comprehensively speaking, modern agriculture depends on advanced agricultural machinery and equipment, and it promotes agriculture with science and technology and helps to realize the marketization, industrialization, intensification and scalization of agriculture with modern production organization and advanced management methods.

The focus of organic connection between small farmers and modern agricultural development lies in breaking through the production, organizational and market weaknesses of small farmers and introducing small farmers into the track of modern agricultural development by ways of land scalization, organizational scalization

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and service scalization^[5]. The effective way is to develop a service organization carrier with integrated functions. Japan, South Korea, and Taiwan of China all have small operating scales. Through the services of farmer cooperative organizations, the scattered small farmers will be integrated into the track of modern agricultural development^[6]. Organizing farmers is an important prerequisite for the realization of China's agricultural modernization and service scalization, and developing farmers' professional cooperatives is an key measure to improve farmers' organization^[7]. In organic connection, productive services, business services and financial services are generally needed to help small farmers. Farmer cooperatives play an important role in various service links^[8].

From local innovation practice, international experience, connection mechanism and mode exploration, *etc.*, the important role of farmers' cooperatives in promoting the organic connection between small farmers and modern agricultural development has been analyzed comprehensively in existing literature, forming a good research basis. However, under the strategic background of village revitalization and giving priority to development of agriculture and rural areas, China's agricultural and rural development situation has undergone major changes. How to realize the organic connection between small farmers and modern agriculture based on farmers' cooperatives needs further exploration. This paper summarizes the connotation of "achieving organic connection between small farmers and modern agriculture" as the follows: on the road to the development of modern agriculture, traditional small farmers are transformed, they are helped to overcome the obstacles faced by modern agricultural operations, and their self-development capabilities are improved to allow them to participate in the construction of modern agriculture. First of all, it should fully understand what obstacles small farmers face in developing modern agriculture and what is unique about farmers cooperatives compared with other types of new agricultural operators in promoting organic connection. Finally, combined with the newly revised *Law of the People's Republic of China on Farmers' Professional Cooperatives*, it should think deeply that in what ways farmers' cooperatives play the role.

2 Problems faced by small farmers in the development of modern agriculture

2.1 Scattered production factors Agricultural production involves a variety of factors, including labor, land, capital, and technology. The condition of decentralized production factors does not meet the requirements of large-scale and intensive agriculture, and it has restricted the promotion of agricultural mechanization and agricultural technology. From the perspective of land resources, the contradictions between Chinese people and land are prominent, and the land is scattered and fragmented. There were about 230 million farmer households. The average operation scale per household was only 0.52 ha. Each of about 91% of the farmer households operated less than 0.667 ha of arable land^[9]. Land abandonment has occurred in recent years. For example, the area of abandonment in Sichuan Province increased by about 10 per-

centage points^[10]. As of 2016, the area of abandonment in Hainan Province reached 15 900 ha^[11]. The current cultivated land resources have not been fully utilized. The scale of operation of small farmers, as agricultural micro-subjects, is too small, the dispersion of agricultural operations is high, and the degree of organization is low, prone to leading to diseconomies of scale and low labor productivity, not conducive to the effective allocation of production factors. Small-scale operation of farmers is not conducive to the promotion of agricultural machinery. Since the promulgation of the Law of the People's Republic of China on Promotion of Agricultural Mechanization in 2004, the central government of China has provided large-scale subsidies for agricultural machinery, and China's agricultural mechanization has been accelerating. However, the self-accumulation ability of small farmers is low, and their income cannot afford the excessive investment in agricultural machinery. Even if individual farmers have bought agricultural equipment, the frequency of use is not high. The high cost of agricultural machinery and equipment has increased the production costs of small farmers.

2.2 Aging labor force and low labor quality The problems of aging labor force and low labor quality faced by small farmers have restricted the development of modern agriculture in China. In recent years, young and middle-aged labor has flowed out. On the one hand, it is conducive to the flow and reorganization of agricultural production factors. On the other hand, the aging and feminization of agricultural labor force and shallowing of human capital have become more severe, which is not conducive to the growth of professional farmers and the application of new agricultural technologies, and has hindered the process of agricultural modernization^[12]. Of the rural labor resources in 2006, 30.4% were under 30 years of age. Among the agricultural production and management personnel in 2016, personnel aged 35 and below accounted for only 19.2%, personnel between 36 and 54 years old accounted for 47.3%, and people over 55 years old accounted for 33.6%^[13]. Small farmers are also facing the challenge of aging in developing modern agriculture. The aging of the agricultural population has caused insufficient supply of labor factor and increased labor costs. From 2004 to 2014, the total cost of grain (rice, wheat, corn) production in China increased from 5 932.5 to 16 029 yuan per hectare, and the average annual labor cost increased by 12.2%^[14].

Generally, small farmers have lower cultural quality. Judging from the composition of the educational level of agricultural production and management personnel, in 2016, the education level of the agricultural production and management personnel was dominated by junior high school and primary school (37% had received primary education, 48.4% had received junior high school education), and there are fewer laborers with high school education. It is necessary to cultivate a new generation of professional farmers who love agriculture, grasp technology and understand management. Cultural quality affects the acceptance of small farmers on modern agricultural development concepts and agricultural

science and technology. Most farmers lack market economy knowledge^[15] and market risk awareness. They pursue blindly short-term economic benefits and lack the ability to consider the objective needs of the market, and their economic benefits are vulnerable to loss.

2.3 Low industrialization of small farmers' production Agricultural industrialization helps to promote the transition from traditional agriculture to modern agriculture as a whole. On the basis of family management, the professionalization, commercialization and socialization of agricultural production will be gradually realized. The agricultural industry chain includes agricultural product production, processing, distribution, and sales. The traditional small farmer operation usually only produces agricultural products, which are usually at the initial stage of the chain and still need to be passed through processors, logistics and storage and transportation companies and sales markets to reach the end of the chain. The profit that can be obtained in the production link accounts for a very small part of the total profit of the industrial chain. Small farmers have not been able to obtain more profit sharing in processing and sales.

2.4 Low market position and weak ability to resist risks The large number of small farmers in China are unorganized, and they enter large market with a tiny market share. Compared with large-scale, organized professional households, family farms and agricultural multinational companies, they lack market competitiveness, and are in a weak position in market transactions. Decentralized individual small farmers have low bargaining status and weak bargaining power. In the transaction, their rights and interests are easily damaged, which will hurt the labor enthusiasm of small farmers. Agricultural production is natural and cyclic and depends on natural conditions such as climate, water sources, and light. Crops have fixed growth cycles. In the growth cycles, they are faced with a number of force majeure events, such as drought, heavy rain, flood, disease and pest. Agricultural activities are at high risk. In addition, the response of operators to market information is often lagging, making it difficult to realize stable market prices. The economic strength of small farmers is weak, and they have few information channels, so it is difficult for them to collect accurate market information in a timely manner. In short, they face greater market risks.

3 Analysis on farmer cooperatives' connection function between small farmers and modern agriculture development

Farmers' cooperatives, family farms and leading enterprises are all important parts of the new-type agricultural management entities, and they interrelated to and interact with each other. However, the three types of new agricultural business entities have different organizational attributes and roles. Operators of family farms are mainly farmers or other persons who have long been engaged in agricultural production, and they rely mainly on family members rather than hired employees to carry out production and business

activities^[16]. Compared to farmers' cooperatives, family farms have a smaller role in absorbing and organizing small farmers. Leading companies have introduced modern business models, often with a large scale of operation, strong economic strength, and advanced management concepts, and they are economic organizations with legal personality. Leading enterprises pursue profits. When their vital interests are inconsistent with farmers' interests, they are prone to ignoring or damaging the interests of small farmers in order to realize their own interests. Compared with other two types of new agricultural operators, farmers' cooperatives have two special characteristics. First, the cooperatives are dominated by farmers. The status of the members is equal. Democratic management is implemented, basically reflecting the nature of "private run, democratic management and benefiting the people", with strong cohesion to organize small farmers. Second, cooperatives take their members as the main service target and serve members as their purpose, thus they can better provide services for small farmers. They pursue profitability externally, and do not seek profitability internally to seek the common interests of all members. Based on the union of small farmers, farmers' cooperatives strengthen the ability of small farmers to produce and manage, maintain the independent economic status of small farmers, and facilitate the development of rural double-tier management system, instead of changing the mode of family contracting. In terms of achieving an organic connection between small farmers and modern agriculture, this article mainly discusses the organizational function, service function and intermediary function of farmers' cooperatives (Fig. 1).

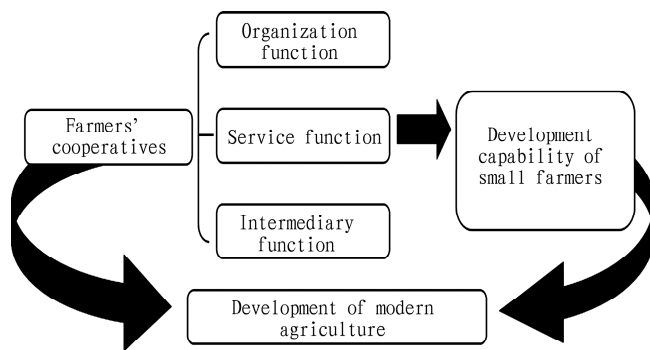


Fig. 1 Three major functions of farmers' cooperatives

3.1 Organizational function: promoting the organization of small farmers On the basis of stabilizing family contracting, cooperatives, as voluntary, democratically managed and mutually beneficial economic organizations, unite farmers, solve the dilemma of decentralized operation and improve the degree of organization to make farmers adapt to the requirements of large-scale and specialized agriculture. In the current regulations on the form of capital contribution by professional farmers' cooperatives in China, members can contribute capital in both currency and non-monetary property (*e.g.* physical asset, intellectual property right, land management right, forest right, *etc.*) that can be valued in currency and can be transferred in accordance with law, diversifying

the form of funding and increasing the enthusiasm of small farmers for investment in participating in cooperatives. The newly revised *Law of the People's Republic of China on Farmers' Professional Cooperatives* clarifies the content of affiliation of farmers' professional cooperatives. More than three farmers' professional cooperatives may contribute to the establishment of affiliation. Affiliation has realized the cooperation between cooperatives, increased the information exchange between cooperatives, further strengthened the cooperation of small farmers, cultivated the concept of cooperation and mutual assistance among small farmers, and broken the closed state of traditional management.

Cooperatives organize small farmers to help bring small farmers into the market and improve the market position of small farmers. The newly revised *Law of the People's Republic of China on Farmers' Professional Cooperatives* clearly states that the state guarantees that farmers' professional cooperatives enjoy equal legal status with other market entities. Thus, the market position of members is supported by law, small farmers are given with organized access to the market, small farmers' market awareness is cultivated, small farmers' ability to participate in the market is exercised, and small farmers' ability to resist market risks is enhanced. Cooperatives organize production based on local production conditions and in conjunction with national industrial policies and market information to avoid information asymmetry and save the cost and effort of small farmers to obtain information. The transaction scale of cooperative organizations is larger than that of a single small farmer, so that the market power of farmers is strengthened. The number of transactions of cooperatives is lower than the form of production and sales by individual farmers, thus the transaction costs of search, negotiation and supervision are reduced.

3.2 Service function: providing specialized services for agricultural production Adam Smith, in his elaboration of the theory of division of labor, considered that the division of labor is an important reason for increasing labor productivity, and it can also generate economies of scale^[17]. In agricultural industrialization, specialized cooperative organizations provide social services for small farmers and drive farmers to carry out agricultural production. The division of labor and collaboration between agricultural industries breaks the small-scale, low-commodity and single-industry situation of traditional farmers. By providing social services and making full use of resources, with advanced production technology, equipment and management methods, the law of diminishing marginal returns of traditional factor inputs is overcome and intensification is achieved^[4]. China's *Strategic Plan for Rural Revitalization* states that it is necessary to actively cultivate social service organizations. The Central Document No. 1 of 2019 also emphasizes the development of new rural service industries and the support for farmers' cooperatives, supply and marketing, postal services and agricultural service companies to carry out agricultural productive services.

As shown in Fig. 2, the agricultural productive services that run through the agricultural production chain basically belong to the business scope of cooperatives, involving all links of agricultural pre-production, mid-production and post-production, and integrating the production of small farmers into the large-scale pro-

duction of agricultural modernization. Among them, financial services and agricultural custody services may be involved in the pre-, mid- and post-production links. Cooperatives facilitate the introduction of advanced and applicable varieties, technologies, and equipment into agricultural production to change the traditional extensive management mode of low production efficiency. They centralize procurement of agricultural production materials, and adopt advanced farming technologies to give full play to the capabilities of agricultural machinery and equipment. For example, through the cooperatives' joint purchase and use of agricultural machinery and equipment, single farmers are allowed to use mechanized operations and repeated purchases of mechanical equipment are avoided, improving utilization and saving production costs and materialization costs. New varieties and standardized production are adopted to improve the output and quality of agricultural products. Finally, a stable supply and marketing relationship is established. Off-line docking between farmers and supermarkets and docking between farmers and cooperatives and online development of e-commerce for purchase-sale docking of agricultural products will help to reduce intermediate links and reduce unit transportation and sales costs, thereby improving small farmers' income.

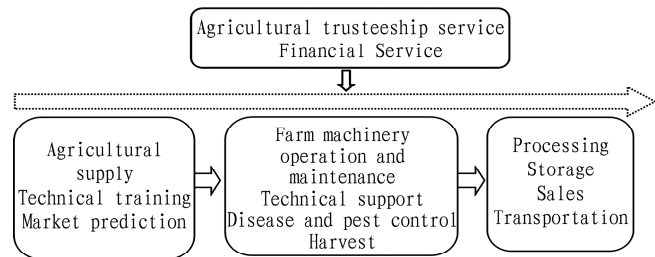


Fig. 2 Main types of service provided by farmers' cooperatives

Without transferring the land management rights of business entities such as small farmers, the agricultural production custody service entrusts complete or part of the farming, planting, prevention and harvesting operations in agricultural production to service organizations. For farmers in Guanghan City, Sichuan Province accepting full trusteeship projects, the cost per hectare is reduced by 57.5% compared to own farming; the yield of rice per hectare has been increased by 750 kg, and the labor costs per hectare have been reduced by more than 4 500 yuan^[18]. Regarding the current abandonment of land and aging and transfer of rural labor force, some small farmers who are unwilling to cultivate or are unable to cultivate, according to their own conditions and needs, entrust the service organizations in the cooperatives to conduct farming. This not only allows small farmers continue to engage in family business but also realizes the sharing of benefits of scale operations. At the same time, throughout the production chain, cooperatives directly sell agricultural resources on credit, carry out internal credit cooperation and mutual funding, provide loan guarantees, and provide financial services to small farmers to alleviate their financing difficulties.

Members are dominant in the cooperatives. The services provided by cooperatives to small farmers are practically needed. It is ensured that the small farmers who join the cooperatives are the

active choosers of technical services and technology extension, rather than passive recipients. The promotion and application of the concept of agricultural modernization and advanced technology must ultimately be implemented on "people". Farmers' cooperatives provide education and training. Combined with the production and operation situation in the region, with the help of the demonstration of organizations, the green agriculture and clean agriculture concepts and new technologies and new varieties can be passed to small farmers faster to lead small farmers to master new technologies, transform agricultural science and technology into productivity and improve the ability of small farmers to develop modern agriculture.

3.3 Intermediary function: realizing the linkage of interests of various parties in agricultural industrialization In the realization of interest linkage of agricultural industrialization, enterprises and farmers establish a purchase-sale relationship in the form of order farming. Enterprises are in an advantageous position and their behavior cannot be effectively checked and balanced, which provides opportunities for them to manipulate prices and drive down prices for agricultural products. Thus, farmers are pushed to the edge of agricultural industrialization value chain distribution^[19]. When the market price changes greatly, due to asymmetric information and incomplete contract, both farmers and enterprises are prone to breach of contract^[20]. In the cooperation mode of "leading enterprises + cooperatives + farmers", cooperatives play a coordinating role as an intermediary between leading enterprises and small farmers. Leading companies sign contracts with cooperatives, and cooperatives then organize members to produce to ensure the orders required by leading enterprises. This not only overcomes the excessive transaction costs of enterprises but also ensures the interests of farmers, thereby preventing the parties from breaking the contract. Some cooperatives absorb small farmers' investment in the form of share cooperation. In addition to obtaining sales income from agricultural products, it is also conducive to a shift to "shared risks and shared profits."

4 Policy recommendations

In the past ten years, the No. 1 documents of the Central Committee of the Communist Party of China are all closely related to the issues relating to agriculture, rural areas and rural people. In the No. 1 document of 2013, the concept of farmers' cooperative was formally used. It is clarified that farmers' cooperatives are the basic subjects that drive farmers to enter the market, and are an effective carrier for innovative rural social management. Since the promulgation of the newly revised *Law of the People's Republic of China on Farmers' Professional Cooperatives* in 2017, it has provided a guarantee for cooperatives to adapt to the development of modern agriculture. The No. 1 documents of the past three years have linked farmers' cooperatives with the cultivation of new agricultural operators. It is pointed out that it is necessary to give prominence to two types of new agricultural business entities, farmer cooperatives and family farms, strengthen the role of cooperatives in the promotion of agricultural science and technology, the expanding of value chain of agriculture, the cultivation of pro-

fessional farmers, and the development of new rural services, and pay attention to the standardized construction of cooperatives. The number of farmer cooperatives is growing rapidly, but attention should be paid to "quality" and paid to whether the actual role of cooperatives is in place. In the management and operation of farmers' cooperatives, there are a lot of unsatisfactory phenomena such as "shell cooperatives", "elite capture" and fraudulent subsidies. The relevant data show that in the surveyed samples, in the past three years, about 52.8% of the cooperatives have not provided socialized services for members in the name of cooperatives, and 35.6% have not carried out any production and operation activities^[21]. In order to give full play to the organizational, service, and intermediary functions of farmers' cooperatives and seek cooperatives to promote the organic connection between small farmers and modern agricultural development, the following suggestions are put forward in this article: (i) strengthening supervision, standardizing the organization and behavior of farmers' cooperatives, promoting the construction of demonstration cooperatives, tracking the development of cooperatives, and improving the withdrawal mechanism of cooperatives; (ii) correctly handling the relationship between the new agricultural business entities; not taking farmers' cooperatives as the only organizations that drive small farmers, further strengthening the integration between new agricultural business entities, and strengthening cooperation between farmers' cooperatives, leading enterprises and family farms with complementary advantages to providing a better development environment for the cultivation of modern small farmers; (iii) When cooperatives provide various services to small farmers, localities must adhere to the principle of adapting to local conditions to conduct scientific and rational planning while meeting the needs of small farmers.

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