

Exploring the Role of Supply and Marketing Cooperatives (SMCs) in Advancing the Modernization of Agricultural Product Distribution in the New Era: Insights from China's Experience

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Abstract

Against the backdrop of advancing the reform of supply and marketing cooperatives in the new era, their distribution functions have unique value in solving the problem of smallholder farmers connecting with the large market and promoting the modernization of the agricultural product distribution system. This study adopts methods such as field surveys and on-site interviews to conduct in-depth analysis of cases from multiple locations, classifying and summarizing typical practical models of supply and marketing cooperatives in the new era that promote the modernization of the agricultural product distribution system. It also compares and analyzes the “Three Rivers Diversion” model, the “Sunflower” model, the “Barbell” model, and the “Ternary Symbiosis” model from three dimensions: the level of efficiency in agricultural product distribution, organizational and operational methods, and related facilities and technologies. The aim is to provide empirical references and reform insights for effective paths to promote the modernization of the agricultural product distribution system by supply and marketing cooperatives in the new era.

Keywords

Supply and Marketing Cooperatives, Modernization of Agricultural Product Circulation System, Circulation Model

1. Introduction

The issue of the agriculture, rural areas and peasants has always been a cross-cut-

ting issue in the ambitious process of modernizing China's agriculture and rural areas. With 500 million of China's 1.4 billion people living in rural areas, the report of the twentieth CPC National Congress emphasized the priority development of agriculture and rural areas, the smooth flow of urban and rural factors, and the promotion of the effective linkage between small farmers and large markets. However, at present, small farmers and large markets are facing many challenges: agricultural products are not sold, "difficult to buy and sell", "low sell high buy" and other long-standing problems (Zhang et al., 2021). According to statistics, most of the vegetables purchased from the wholesale market have a markup rate of up to 80% or more, "agricultural super docking" channels of vegetables have a markup rate of more than 60%. One of the root causes is too many circulation links, and high circulation costs (Cheng, 2024).

Compared with other countries, China's agricultural product distribution model faces unique challenges. First, in terms of the main body of production, Chinese agriculture is still dominated by a small-farm economy, with about 230 million small farmers across the country, a small average size of arable land, and a high degree of decentralization of agricultural production. This contrasts sharply with the large-scale mechanized farms of North America, the organized production of agricultural associations in Japan, and the Dutch system of agricultural cooperatives. Small farmers have weaker bargaining power in the market and find it difficult to directly connect to large retail terminals or foreign trade markets, resulting in more distribution links and higher costs. Secondly, in terms of the distribution model, Chinese agricultural products are mainly distributed through markets and wholesale markets, relying on multiple levels of intermediaries, rather than the North American "producer-supermarket direct sales" model (Bian, 2010) or the Japanese "agricultural cooperative-auction-market" system. The "producer-supermarket" model in North America (Bian, 2010) or the "farmers' association-auction market" system in Japan. Although some regions in China (e.g., Shouguang in Shandong) have tried to digitize distribution, a unified national distribution system has not yet been fully established, resulting in high market volatility and inefficient matching of supply and demand. For example, in 2021, 40% of celery in one province was not sold precisely because farmers lacked market information and relied on experience to make planting decisions, failing to accurately match demand. In addition, in terms of market mechanism, China's agricultural products trading method is still based on traditional bargaining, lacking the mature auction system of Japan, the Netherlands and other countries (Yu, 2017). The price information of domestic agricultural products is not transparent, and the market adjustment mechanism is still unsound. The degree of informationization is also a special feature of China's agricultural product circulation system. The Netherlands has achieved efficient matching of supply and demand through agricultural cooperatives and digital auction systems, while the construction of China's agricultural information platform is still in its infancy. Fresh food e-commerce has developed rapidly in recent years, but it is still difficult to replace

the traditional distribution model on a large scale.

Supply and marketing cooperatives (SMCs) can play an important role in promoting the modernization of agricultural product distribution by helping farmers sell their agricultural products directly to SMCs at a reasonable price, and then SMCs sell them to consumers, so as to reduce the number of distribution links, lower the cost, and realize the increase in farmers' incomes and the benefit of consumers. Therefore, former Premier Li Keqiang has specifically requested that supply and marketing cooperatives be built as an important carrier for the country to promote the work of the "Three Rural Areas" and provide direct services to farmers. On the occasion of the 70th anniversary of the founding of the All-China Federation of Supply and Marketing Cooperatives (ACFMC), Supply and marketing cooperatives have been entrusted with a pivotal role in advancing the high-quality development of agricultural supply chains and the circulation of agricultural products, as evidenced by the significant contributions of agricultural science and technology to production growth., to serve farmers' production and life, and to promote the integrated development of rural and urban areas and the modernization of agriculture and rural areas. 2024 Document No. 1 of the Central Government emphasized the promotion of the high-quality development of rural circulation, and the modernization of the agricultural product circulation system is an important part of the Chinese-style modernization. The current situation of agricultural product circulation in China is marked by an imbalance among the eastern, northeastern, central, and western regions, and Challenges such as inefficient agricultural production and marketing, elongated circulation channels, and low efficiency contribute to the waste of agricultural products, inefficient resource utilization, increased production costs for farmers, and reduced returns. These issues not only hinder the process of common prosperity but also exacerbate the urban-rural divide and impede the development of modern rural industries.

The purpose of this study is to explore the role and new practice patterns of supply and marketing cooperatives in the agricultural product circulation system in the new era through field research, and to contribute marginal power to the improvement of China's research system of supply and marketing cooperatives in the new era. Through field research on the modernization status of the agricultural product circulation system in many places, we present the practice pattern of the agricultural product circulation system in the new era in multiple dimensions. Through case analysis of multi-local patterns, we aim to strengthen the practical guidance of research on supply and marketing cooperatives, thereby supporting the agricultural product circulation system and refining the related theoretical framework. The insights provided by the research and analysis of the comprehensive reform of supply and marketing cooperatives are crucial for the modernization of China's agriculture and rural areas. These reforms aim to enhance the competitiveness and service capabilities of these societies, ensuring they meet the evolving market demands and the diverse needs of farmers, leading to the new

quality productive forces of CO-OP enterprises in which supply and marketing cooperatives participate increased significantly (Zheng et al., 2024), thereby promoting the construction of a more efficient and sustainable agricultural economy. This study provides enlightenment for the modernization of China's agriculture and rural areas and the comprehensive reform of supply and marketing cooperatives in the new era, promotes the construction of grassroots organizations and supply chain systems, thereby offering valuable insights into addressing the issue of agricultural products being "expensive and difficult to buy and sell", enhancing farmers' incomes, and ensuring the advancement of people's livelihoods.

2. Literature Review

2.1. Studies Related to the Development and Functions of Supply and Marketing Cooperatives

The development of supply and marketing cooperatives is closely linked to national economic policies and national needs. During the Revolutionary War, they emerged and laid the groundwork, leading to the birth of comprehensive cooperatives engaged in salt transportation, supply and marketing, among other fields. In the early days of New China's founding, the supply and marketing cooperative system expanded, catering to farmers' needs and serving as a bridge connecting various economic sectors, including urban and rural areas, workers and peasants, and the government and farmers. From the late 1950s to the late 1980s, supply and marketing cooperatives developed and adjusted with twists and turns, and made remarkable achievements in restoring rural bazaars, completing the task of acquisition, and developing the exchange of commodities, and stabilizing the rural economic order by implementing the policy of unified purchasing and marketing and carrying out their own business. From the 1990s to the 21st century, supply and marketing cooperatives' development was intricately tied to national economic policy. Between the 1990s and the 21st century, supply and marketing cooperatives underwent transformation and upgrading towards marketization. Driven by both policy and market forces, they established urban and rural business networks, with enterprises leading and chain management serving as the operational mode, adapting to the market economy and enhancing their competitiveness, and the relevant documents of 1995 have accelerated the reform of their marketization. Since the 18th CPC National Congress, On the foundation of consolidating their traditional functions, supply and marketing cooperatives have been broadening their service scope, "actively innovating the organizational system and service mechanism, and playing a role in building modern agriculture" (Wang et al., 2023). Enhance the comprehensiveness and convenience of services for the "Three Rural Areas" and build a comprehensive platform to serve farmers. In the construction of rural revitalization and modernization of agriculture and rural areas, the role of supply and marketing cooperatives has become increasingly prominent. It is evident that the evolution of supply and marketing cooperatives has been a continuous process of adaptation to the times, serving the national

strategy throughout. Throughout various stages, supply and marketing cooperatives have consistently contributed to rural development by refining their positions and business models, and will play an even more crucial role in the process of agricultural and rural modernization in the future.

With the development of the new era, supply and marketing cooperatives should meet the requirements of the times and the objectives of national policies and play their important role. Despite their notable achievements, China's supply and marketing cooperatives still face numerous deficiencies. Relevant research on China's supply and marketing cooperatives has highlighted their shortcomings, prompting scholars to propose that they should play a more pivotal role. The current agricultural product circulation system lacks a prominent main force, hindering the effective utilization of the industry's advantages to facilitate the smooth flow of agricultural products into urban areas (Tong & Zhou, 2024). Other scholars have pointed out that local governments do not have a clear understanding of the positioning of the functions of supply and marketing cooperatives, and there is a trend of marginalization of supply and marketing cooperatives. Supply and marketing cooperatives are no longer recognized by the social economy in the process of constantly generated market interaction (Chen, 2024). Furthermore, the traditional operation and management of grassroots supply and marketing cooperatives typically rely on an offline business model grounded in the physical economy, plagued by asymmetric market information and restricted access to purchase and sales data (Deng & Zhu, 2023).

In recent years, the recovery of supply and marketing cooperatives has ushered in a boom in the country, and supply and marketing cooperatives have gradually become a hot topic. Currently, research within China's academic circles on supply and marketing cooperatives primarily centers on their roles in agricultural socialization services and their contributions to addressing the "three rural issues", which is limited to the interpretation of macro policies and lacks the basis of field research. Moreover, research on the role of supply and marketing cooperatives in agricultural product circulation is scarce, and multi-dimensional analyses of their operational modes are lacking. This paper aims to summarize the various modes of supply and marketing cooperatives in agricultural product circulation, and to analyze the specific role each mode plays in advancing the modernization of the agricultural product circulation system through comparative analysis.

2.2. Study on the Relationship between Supply and Marketing Cooperatives and the Modernization of the Distribution System for Agricultural Products

The circulation system of agricultural products is an organic unity composed of circulation elements, and the goal is to coordinate all aspects to maximize circulation benefits and minimize costs. In the definition of modernization of agricultural product circulation, some scholars emphasize the importance of its modern

marketing concept from the perspective of marketing; some scholars emphasize the importance of the establishment of the circulation system from the connection of circulation links (Cai, 2021). Other scholars also hold that the modernization of agricultural product circulation constitutes a dynamic evolution within the agricultural product circulation industry, striving to streamline the circulation of agricultural products and thereby satisfy the demands of contemporary economic and social progress (Li & Li, 2012).

Based on relevant literature, this paper defines modernization of the agricultural product circulation system as the extension of modern circulation practices in agriculture, aiming to enhance circulation efficiency and meet economic and social development goals through scientific and technological advancements and management methods, thereby transforming and upgrading traditional circulation technology and facilities, elemental inputs, organizational forms, efficiency and effectiveness, and fostering the dynamic development of its constituent dimensions. The constituent dimensions encompass circulation scale, efficiency level, organization and operation mode, facilities, and technology.

Supply and marketing cooperatives around the world to promote the modernization of the circulation system for agricultural products using a variety of modes, each with its own advantages and disadvantages: supply and marketing cooperatives in Yunnan Province to implement the “rural circulation project”, to create a network of business services, but the response to the market is inflexible, operating costs are high and the development of the region is not balanced; the development of the “two societies, one association”. In Yunnan Province, supply and marketing cooperatives have launched the “Village Circulation Project” aimed at constructing a business service network. However, they lack flexibility in adapting to market changes, face high operational costs, and exhibit uneven regional development. they have developed “two societies, one meeting” to build an integrated professional cooperative, but there are problems with the internal mechanism, the role of industry associations and the quality of service of the service societies; they have implemented the “four villages, five yeses” initiative, yet the impact of information services and training remains limited, with inadequate market infrastructure and management (Du, 2012). In Sichuan and Xizang, the model with social enterprises as the core is highly driven, but relies on third-party cold chain logistics; the model with logistics centers as the core is highly efficient in logistics, but unstable in the supply of vegetables; and the model with agricultural products wholesale markets as the core is highly flexible in the market, but inefficient in circulation and high in cost (Deng, 2023). Inner Mongolia’s supply and marketing society has adopted an agricultural model of “one network, multi-stream, two-way profit”, making full use of e-commerce platforms to integrate resources and reduce costs, but rely on e-commerce platform, facing technical and network security issues, and the market demand and logistics differences in adaptability to be explored (Xia & Li, 2015). The “New Network Project” model of Xinjiang Supply and Marketing Society effectively links to the market, yet faces constraints

from the expenses of information integration and safety traceability. The institutional reform model strives to build a modern cooperative system, yet encounters obstacles related to property rights and various other matters. The “Agricultural Supermarket Docking” model shortens the circulation chain, yet lacks the capacity to address market demands and logistical discrepancies. (Xia & Li, 2015). The “agricultural super-docking” model reduces distribution links yet lacks comprehensive strategies to address market fluctuations and logistical disparities (Xu & Wang, 2011). The production and marketing docking model of Guizhou Provincial Supply and Marketing Society, spearheaded by Lutong Company, precisely aligns supply with demand, thereby facilitating poverty alleviation efforts; Guinong Network promotes the circulation of specialty agricultural products; The Cold Chain Logistics System, under the leadership of Cold Investment Company, incurs significant construction costs has a long payback period. The application of modern concepts and technology enhances circulation efficiency, yet it necessitates highly skilled personnel and swift technological advancements. The demands for technical personnel are stringent, and technological updates are frequent (Meng & Wang, 2024). supply and marketing cooperatives in Zhejiang Province integrate resources through the construction of modern agriculture and urban and rural trade service system, develop new business forms such as e-commerce and innovative forms of circulation, established comprehensive service centers tailored for town-level and industrial agricultural cooperative unions, ensuring precise services, while also initiating the “two major platforms” to fortify financial security, thereby advancing the modernization of agricultural product circulation systems, but the “two major platforms” are still under exploration. The “two platforms” are still being explored, and the township agricultural cooperative union and related systems are weak, and the functional benefits have to be fully realized (Xu et al., 2018). Shandong Qingdao City Supply and Marketing Society adopts land trusteeship and full service to promote income generation with the model of “guaranteed income + surplus dividend”, which is difficult to promote due to the influence of geographical location and farmers’ concepts, and the integrated model of “production plus marketing” covers the whole industrial chain, but it is difficult to collaborate with each link and the investment of resources is large; through community store building and exhibition and marketing, it is difficult to modernize the distribution system. The model of “production plus marketing” covers the whole industry chain, but it is difficult to collaborate with each link and has a large investment of resources: The model of developing markets through building community stores and exhibitions has high costs for brand promotion and market maintenance; the model of building a smart park and three-tier circulation system led by a large project has a long construction period and a large investment in the early stage. (He & Zhu, 2022). The supply and marketing cooperative in Quzhou County, Hebei Province, has established a sales network for agricultural materials and daily necessities, offering offline convenience; however, service in remote areas remains challenging; The e-commerce platform has

expanded sales channels, yet it encounters challenges related to e-commerce talent operation level; relying on enterprises to build a cold-chain logistics network to enhance the value of agricultural products, but there are problems of upfront inputs, operation costs and high technical requirements.

However, there are still some limitations in the current research, the comparative study of the supply and marketing cooperative model in different regions is not in-depth enough, and there is a lack of discussion on the mechanism of synergistic development between supply and marketing cooperatives and other rural economic organizations, and no systematic solution has yet been formed in terms of how to effectively overcome the existing problems of the model of circulation of agricultural products, as well as strategies to enhance the role of supply and marketing cooperatives in modernizing agricultural product circulation, among other aspects.

So the marginal contribution of this paper lies in: firstly, studying the modernization of agricultural product circulation systems, using supply and marketing cooperatives as the entry point to transcend traditional research confines of commerce and trade circulation enterprises, as well as the limitations of circulation links, based on the characteristics of supply and marketing cooperatives rooted in the countryside, with a sound network and wide distribution, exploring their unique effectiveness in integrating the resources of agricultural products and linking up with multiple parties, focusing on the deep participation of the whole industry chain, and systematically and comprehensively analyzing the role of supply and marketing cooperatives in promoting agricultural products circulation system modernization, while also examining the role of supply and marketing cooperatives in this process advancing the modernization of the agricultural product distribution system, thereby presenting a novel and distinctive research perspective. Secondly, we summarize in depth, compare comprehensively and select accurately the different existing models of supply and marketing cooperatives in promoting the modernization of the agricultural product circulation system in the new era. In our follow-up study, we will embark from a macro perspective to conduct a more thorough analogical analysis of the modes employed by supply and marketing cooperatives. cooperatives in various regions should adapt to local conditions, and based on this, propose innovative models to offer more precise and practical theoretical backing and guidance for the sustained growth of supply and marketing cooperatives, as well as the modernization of agricultural product circulation systems. Thirdly, most of the existing literature focuses on the study of a particular region's unique agricultural product circulation model. This paper will adopt a multi-case longitudinal comparative study, integrating quantitative multi-case study and qualitative research, in order to explore the modernization of agricultural product circulation system of supply and marketing cooperatives in the new era of supply and marketing cooperatives to promote the modernization of agricultural product circulation system mode to provide a comprehensive and in-depth research point.

3. Analysis of the Prominent Role of Supply and Marketing Cooperatives in Promoting the Modernization of the Circulation System for Agricultural Products

The nature of supply and marketing cooperatives in the new period is a mixed organization with the tradition of cooperative economy and administrative nature, serving farmers under the socialist system with Chinese characteristics. It has the comparative advantages of providing legitimacy to multiple parties and saving transaction costs, which are mainly reflected in the following aspects.

3.1. Market Connectivity

The report of the 20th Party Congress emphasized the need to adhere to the priority development of agriculture and rural areas, promote the seamless docking of urban and rural resources, cultivate innovative agricultural business mainstays, expand socialized services, promote the moderate-scale operation of agriculture, and establish an effective linkage between small farmers and the big market. Supply and marketing cooperatives, as public welfare distribution organizations serving agriculture under the leadership of the Party, play a crucial coordinating role in organizing small farmers' access to markets and selling small farmers' shared wealth (Wu, 2024).

Supply and marketing societies have enterprises and grassroots cooperatives as business units that have long been engaged in business and cooperation with private enterprises. The opening and deepening of market-oriented reforms since the reform and opening up of China has led supply and marketing cooperatives to strive to adapt to the economic environment and social needs for change and development, and their organizational development has a clear market embeddedness. From the viewpoint of the organizational technology of supply and marketing cooperatives, the business of supply and marketing cooperatives has expanded the commercial function of the planned economy, and has evolved in the market-oriented reform to include activities previously carried out by all enterprises in the society, thus showing the organizational characteristics of "similar to the market" (Xu & Jin, 2024). In response to the national call to meet market demand, most supply and marketing cooperatives are using advanced technologies such as digitalization, informatization, and intelligence to innovate agricultural distribution models. These initiatives aim to expand distribution channels, broaden the scope of market operations, streamline intermediate links, and ultimately improve distribution efficiency while reducing production costs, to help establish a modern Internet-based distribution system for agricultural products. There are also some supply and marketing societies that encourage, guide and support new agricultural business entities to realize large-scale and standardized production and operation of agricultural products, improve the quality and yield of agricultural products, and increase market competitiveness and economic benefits by leading and founding farmers' professional cooperatives. According to relevant data, the whole system has built and operated more than 4200 agricultural

product markets and more than 7500 agricultural product business enterprises, and the whole system will realize agricultural product sales of 3.16 trillion yuan in 2023. From a national perspective, supply and marketing cooperatives, as an important circulation subject, its combined efforts can effectively accelerate the construction of modern circulation networks, promote the acceleration of the construction of a modern circulation strategy hub, which is conducive to the construction of a unified national market, provide strong support for the construction of a new pattern of development, and bring inexhaustible power for high-quality development. In addition, according to the Decision of the CPC Central Committee and State Council on Deepening the Comprehensive Reform of Supply and Marketing Cooperatives, the construction of agricultural products market of supply and marketing cooperatives will be included in the national agricultural products market development plan, the construction of large-scale agricultural products wholesale markets and modern logistics centers in the circulation area, and the construction of agricultural products marketplaces and warehousing facilities in the place of origin. Fresh food supermarkets and other retail terminals will be constructed in urban communities, forming a reasonably laid-out network of agricultural product markets that connects origins and consumption terminals. Supply and marketing cooperatives can promote the upgrading and reshaping of diversified agricultural product markets, implement various forms of production and marketing integration, and strengthen the role of agricultural product distribution services.

Supply and marketing cooperatives actively integrate the resources of small farmers, build market networks for agricultural products, and innovate distribution models, significantly reducing transaction and production costs, and enhancing the efficiency and market competitiveness of agricultural product circulation. 2025 The Eighth Plenary Session of the Seventh Council of the General Council of the All-China Federation of Supply and Marketing Cooperatives (ACFMC) emphasized the improvement of the modern circulation system, and the upgrading of the level of agricultural products' smooth flow of goods and commodities. In Guangdong, for example, the province's supply and marketing societies in 21 cities and municipalities comprehensively constructed a direct supply and distribution network for agricultural products, built 96 regional distribution centers, 2024 Guangdong, Hong Kong and Macao, the Great Bay Area, the first phase of the production and supply base of green agricultural products put into operation, a cumulative total of 9.6 billion yuan of gross output value of the park sinks, services for the processing of agricultural products circulation of more than 260,000 tons. This makes the circulation time of agricultural products from the origin to the consumption terminal significantly shortened, reduces intermediate losses, and optimizes the distribution of benefits among producers, distributors and consumers. The rise of agricultural e-commerce platform, breaking the geographical restrictions of the traditional sales model, farmers can sell agricultural products directly to consumers, not only to increase their own income, consumers can also

buy fresh agricultural products at a more affordable price, to achieve a win-win situation, and promote the reasonable distribution of agricultural products in different regions and among different groups, and promote the optimal allocation of resources.

3.2. Policy Direction

In the process of promoting the modernization of the circulation system of agricultural products, the policy has given supply and marketing cooperatives a pivotal and special role. The CPC Central Committee and the State Council's Decision on Deepening the Comprehensive Reform of Supply and Marketing Cooperatives requires that "supply and marketing cooperatives should focus on the modernization of agriculture, adapt to the production and living styles of farmers, and strive to extend their circulation services to the socialization of agriculture and to the services of urban and rural communities". Supply and marketing cooperatives, as a system of cooperative economic organizations closely linked to farmers, have complete service functions and efficient market-oriented operations. The theoretical basis for their existence lies in solving the development problems of China's "three rural areas", and their core significance lies in strengthening the social organization of farmers through the cooperative system, promoting the industrialization of the agricultural economy, and thus completely changing the situation of farmers and individual farmers. The focus of the cooperative system should be to improve the social organization of farmers and promote the industrialization of the agricultural economy, so as to change the relatively disadvantaged position of peasants and individual farmers in the development of China's market economy (Huang, 2023). In short, the Party and the State have defined the roles and responsibilities of supply and marketing cooperatives in the best interests of the masses and the State, while providing them with policy support and guidance; these supply and marketing cooperatives, as a key force that the Party and the Government can rely on and utilize to serve the peasants, have made a significant political and social contribution, always keeping in mind the objectives of State policy.

The policy embedding role played by supply and marketing cooperatives is very significant and has a positive effect on the construction of rural grassroots organizations, the development of village collective economy, and the implementation of poverty alleviation policies (Wang, 2022). Supply and marketing societies in the field of farmers' cooperative economy show a diversified and vertical deepening mode of participation, not only to provide support, but also to participate directly in the form of equity, effectively becoming an important platform for serving farmers, an important bridge between the party and government and farmers, and a powerful boost to the construction of agricultural modernization. In the case of supply and marketing societies and organizations to build the village community, closely around the construction of rural grass-roots service-oriented party organizations and precision poverty alleviation and other policies to work to achieve in-depth integration. In the process of modernizing the agricultural product circulation system, supply and marketing societies have made full use of the resources

and advantages of grass-roots Party organizations through the effective way of village-community co-construction, expanded the channels of agricultural product circulation, vigorously strengthened the branding of agricultural products, and actively promoted the upward mobility of agricultural products, thus successfully realizing the synergy between the agricultural product circulation system and various policies in the countryside, and effectively enhancing the overall effectiveness of agricultural product circulation.

Therefore, in the context of China's comprehensive implementation of the rural revitalization strategy, and facing the vision of 2035, supply and marketing cooperatives can help hold high the banner of agricultural services, adhere to the attributes of the cooperative economy, give full play to their traditional advantages in commerce and trade, strengthen the functions of agricultural services, and focus on solving the problem of market failures in which farmers lacked the knowledge or willingness to do so but failed to do so, so as to play a key market "complementary" role (Xu & Jin, 2024). It will play an important market "complementary" function and become a reliable, manageable and effective pillar for the Party and the government to promote rural revitalization and modernization of agriculture and rural areas (Xu & Jin, 2024).

Relying on policy support and guidance, supply and marketing cooperatives have been deeply involved in the construction of rural grassroots organizations and the implementation of poverty alleviation policies. Guangdong has carried out a pilot project of "society and village" cooperation, selecting 12 pilot counties to integrate advantageous resources such as agricultural materials, agricultural technology, and cold chain services, and to build a whole-industry operation and service system to help farmers increase their incomes. Nanxiong City, for example, rice as its leading industry, innovative "EPC + O" model to promote the construction of high-standard farmland, participating in the five administrative villages is expected to bring 1.27 million yuan for the village collective income. By expanding the distribution channels of agricultural products, increasing the added value of agricultural products, driving farmers to increase their income and grow their collective economy, supply and marketing cooperatives have effectively narrowed the income gap between urban and rural areas and promoted social equity. In the process of industrial poverty alleviation, supply and marketing cooperatives help poor farmers to market their agricultural products and stabilize their sources of income. When agricultural products are stagnant or in short supply, they are regulated according to policies to stabilize market prices, guarantee the reasonable distribution of agricultural products in different periods and among different consumer groups, and maintain market order.

3.3. Social Network Complementarity

Supply and marketing cooperatives have been rooted in rural areas for a long time, playing the role of the main channel for agricultural products, accumulating social network resources, and gathering a lot of "soft information" favorable to farmers. Supply and marketing cooperatives have seized the major opportunity of building

a strong agricultural country, and played a unique advantage of connecting urban and rural areas, integrating production and marketing, and promoting urban-rural integration. and rural circulation channels, improve circulation efficiency, and accelerate the formation of a new circulation model with two-way international and domestic circulation, seamless online and offline connection, and extensive coverage of urban and rural outlets (Tong & Zhou, 2024), with its business network spreading across urban and rural areas in a wide range of locations. In 2020, the number of grassroots cooperatives' business outlets under the nationwide supply and marketing cooperative system will have increased by 20 percent. The supply and marketing cooperative system has greatly expanded its network and now has 488,000 business outlets in almost every corner of urban and rural areas across the country, compared to 341,000 outlets previously.

Above all, the supply and marketing cooperatives have helped to create a streamlined and effective system of socialized agricultural services. As of November 2024, the supply and marketing cooperative system as a whole had employed a variety of strategies, including union assistance and business initiatives, to nurture 15,000 grassroots organizations, specialized farmers' cooperatives, socially owned enterprises, and other agricultural service entities, while 17,000 farmers' production service centers and 63,000 crop hospitals had been established; and second. Supply and marketing cooperatives have helped improve marketing services. Currently, the system as a whole has established and operates more than 4200 agricultural markets and more than 7500 agricultural business enterprises. The supply and marketing cooperative system has once again expanded from distribution services to comprehensive services for urban and rural communities, creating a three-tier distribution service network in counties and townships. Logistics and distribution centers and shopping malls based on counties, comprehensive supermarkets based on townships, and comprehensive service societies based on villages provide integrated services such as sales of daily necessities and agricultural products, recycling of renewable resources, courier distribution services, upstream marketing of agricultural products, and financial services to urban and rural residents, and create a comprehensive platform for county services that serves farmers' production and life within the county. By the end of 2023, the system had developed more than 6100 chain enterprises and built more than 8000 distribution centers. Finally, supply and marketing societies have also focused on consolidating grassroots service positions, promoting the standardization of grassroots cooperatives, accelerating the transformation of grassroots cooperatives, and further strengthening the interest links with farmers, so that the comprehensive strength of grassroots cooperatives and their ability to serve farmers have been gradually enhanced. In 2023, the sales of grassroots cooperatives across the system and the farmer cooperatives they led in founding have increased to nearly half of the total sales of the whole system. In addition, supply and marketing cooperatives have helped to establish and improve a fast, safe and authoritative information dissemination network on the agricultural market, realizing interconnected information sharing. Supply and marketing cooperatives, with their

rich organizational resources and highly perfected service system, have provided a solid foundation for the construction of a modern agricultural product circulation system, significantly reducing circulation costs. As cooperative economic organizations with Chinese characteristics, China's supply and marketing cooperatives play an irreplaceable role in promoting rural economic development and serving farmers' production and life.

With the help of accumulated social network resources, supply and marketing cooperatives have constructed a socialized agricultural service system, expanded sales service channels, built a comprehensive service network in urban and rural areas, and improved the information dissemination network. The supply and marketing cooperative system in Guangdong Province has taken advantage of the two-tier operation mechanism of the organization system and service network, with the area of agricultural socialized services reaching 5,839,500 mu in 2024, a year-on-year increase of 55%, and helping farmers increase their income by more than 160 million yuan. The county and township three-level circulation service network allows agricultural products to enter the market faster, reduces inventory backlogs and improves turnover efficiency. The information dissemination network enables farmers to adjust their production plans in a timely manner based on market demand, avoiding an imbalance between supply and demand. The standardization of grass-roots cooperatives has closely linked their interests with those of farmers, allowing farmers to gain more benefits from the distribution of agricultural products and enhancing the enthusiasm and fairness of farmers' participation in the distribution.

By making concerted efforts in market connectivity, policy orientation and social network complementarity, supply and marketing cooperatives have effectively transformed their own advantages into increased efficiency in the distribution of agricultural products, which is of far-reaching significance in promoting rural economic development, serving farmers' production and life as well as facilitating the implementation of the strategy of rural revitalization. In the future, supply and marketing cooperatives should continue to give full play to their own advantages, actively respond to the call for policies, constantly innovate their development mode, better adapt to market changes, and contribute more to improving the distribution efficiency of agricultural products and realizing the modernization of agriculture and rural areas.

4. Analysis of the Mode of Promoting the Modernization of the Circulation System for Agricultural Products by Supply and Marketing Cooperatives in the New Era

4.1. Characteristics of the Mode of Modernization of the Distribution System for Agricultural Products Promoted by Supply and Marketing Cooperatives in the New Era

The modernization process of the agricultural product distribution system is influenced by regional natural resource availability and economic development lev-

els, leading to a variety of development models and practices. The significant variations in natural resources among regions, including climatic conditions, soil types, and water availability, directly affect the range of agricultural products and their production volumes. Concurrently, the level of regional economic development also plays a crucial role. The development of C technology significantly influences the construction level of agricultural distribution infrastructure, the extent of logistics technology application, and the diversification of market demand patterns.

Considering the aforementioned factors, the establishment of the local agricultural product circulation system model faces significant constraints and exerts considerable impacts. In this context, local supply and marketing cooperatives, after comprehensive and in-depth consideration, aim to maximize both agricultural circulation efficiency and economic returns by exploring a modern agricultural circulation model tailored to local conditions. Based on various perspectives This paper summarizes the modes of supply and marketing cooperatives in the new era, focusing on circulation channels, circulation subjects, technology application, and market environment, to promote the modernization of agricultural product circulation systems, primarily encompassing the following four types:

1) Farmers + Supply and Marketing Cooperatives + Consumers—Three Rivers Diversion model (see **Figure 1**).

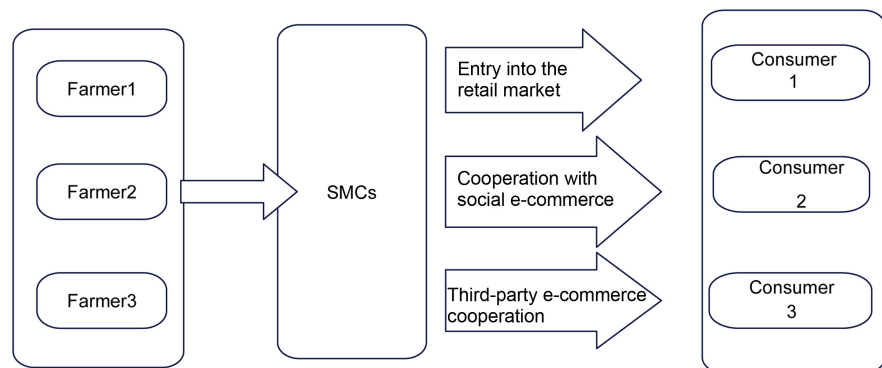


Figure 1. Three rivers diversion model.

In the model comprising farmers, supply and marketing cooperatives, and consumers, the cooperatives play a pivotal role in integrating agricultural product supplies and serving as the nexus connecting farmers with consumers. These cooperatives consolidate the agricultural produce from numerous decentralized farmers and subsequently disseminate it to consumers via diverse distribution channels.

In China's rural production system, smallholder farmers are typically decentralized, encountering challenges like limited market information, diminished bargaining power, outdated production technology, and insufficient cooperative awareness (Xu et al., 2024). In order to ensure the efficient and effective connection between farmers and consumers, supply and marketing cooperatives play a

crucial role in the agricultural supply chain. Supply and marketing cooperatives help farmers obtain richer market information, improve their market competitiveness and status, and promote farmers to achieve standardized and large-scale production by organizing training, thus increasing their sales income. Furthermore, with the active involvement of supply and marketing cooperatives, a comprehensive online and offline operation model has been implemented. This model modernizes the distribution of agricultural products by leveraging offline retailing, online social platforms, and collaborations with third-party e-commerce companies.

Given the presence of three distinct diversion routes for supply and marketing cooperatives, the model has been termed the “Three Rivers Diversion Model”. This model features a characteristic relationship among market participants as outlined below:

First, Supply and marketing cooperatives are positioned directly within retail markets, enabling them to place agricultural products straight into retail outlets for sale to end-consumers. This model is particularly suited to the sale of fresh or localized agricultural products, which can respond quickly to market demand. According to the Opinions of the General Office of the State Council on Accelerating the Development of Circulation and Promoting Commercial Consumption, the model of direct supply and direct sale of agricultural products is encouraged to reduce intermediate links, lower the cost of circulation, and ultimately benefit consumers. Under this model, consumers are able to purchase fresh agricultural products at lower prices, especially in the sale of localized specialty agricultural products, and consumers are able to purchase agricultural products at a level closer to the price of the origin and enjoy a more convenient purchasing experience. For instance, the Dounan Flower Market in Kunming, recognized as Asia’s largest flower market, hosts numerous florists’ cooperatives (Yang, 2023). This cooperative model is a prime example of how the market sustains its status as a central hub for the flower industry.

Second, supply and marketing cooperatives are cooperating with social e-commerce. Through social e-commerce platforms such as WeChat, Jitterbug, Weibo and Shutterbug, real-time information on agricultural products is displayed to consumers, and with the help of e-commerce platforms, consumers can buy high-quality agricultural products from all over the country without leaving their homes, and ultimately realize the sale of agricultural products.

Third, supply and marketing cooperatives cooperate with third-party e-commerce platforms. Utilizing third-party e-commerce platforms like Jingdong, Taobao, and Pinduoduo, agricultural products are sold straight to consumers, establishing a direct dispatch model from the source. This channel has a wider market coverage, provides consumers with more choices, and is suitable for the promotion and sale of branded agricultural products or agricultural products with a higher degree of standardization. Meanwhile, regardless of whether or which cooperative households participate in e-commerce adoption significantly increases household income (Chen et al., 2023).

Dali Bai Autonomous Prefecture, Yunnan Province, Binchuan County, Bijun Agricultural Products Marketing Professional Cooperative, for example, in 2017, the cooperative set up an e-commerce operations department, to carry out agricultural products network sales business, successively in the online opening of the “Hot Treasure Fruits and Vegetables” network store, built a youth e-commerce business park, with an e-commerce team of more than 30 people, the implementation of online and offline sales model as a whole. One sales model. At present, the cooperative garlic products e-commerce sales price of 20 yuan/kg, higher than the offline entity sales price of 2 - 4 yuan, to become a number of e-commerce platforms garlic category TOP1 merchants. 2023, the realization of e-commerce sales of agricultural products of more than 3 million orders, sales of agricultural products of more than 10,000 tons, and sales exceeding 100 million yuan, of which online sales of agricultural products accounted for more than 70%. Above all, the cooperative innovative benefit linkage mechanism, through the whole link rebate to drive the member farmers to group development, out of an agricultural procurement, agricultural production, processing, and sales of industrial closed-loop development road, to realize the farmers’ income, enterprise development, local benefit.

The model is applicable to South China (such as Guangdong, Guangxi, Hainan) and Southwest China (such as Yunnan, Guizhou). South China has a warm and humid climate, which is suitable for growing tropical fruits, vegetables and other fresh agricultural products. In the Three Rivers diversion model, supply and marketing cooperatives are directly connected to the retail market and can respond quickly to market demand, which is suitable for the rapid circulation of fresh agricultural products. For example, Hainan’s tropical fruits can be sold through supply and marketing cooperatives directly into local supermarkets or through social e-commerce platforms, reducing intermediate links and ensuring product freshness. Southwest China has a complex terrain, and agricultural products are scattered and dominated by small farmers. Supply and marketing cooperatives can effectively solve the problem of information asymmetry and enhance the market competitiveness of farmers by integrating decentralized agricultural resources and using social e-commerce and third-party e-commerce platforms (e.g., Pinduoduo and Taobao) for sales.

2) Farmers + Marketing Cooperatives + Retailers + Consumers: The Sunflower Model (see **Figure 2**).

The “farmers + supply and marketing cooperatives + retailers + consumers” model entails the centralized integration of agricultural products from farmers through cooperatives, and their subsequent unified supply to retailers for eventual sale to consumers. Retailers include a diverse range of outlets such as specialty stores, supermarkets, and convenience stores, with sales exhibiting a high degree of dispersion, and a wide range of distribution, resembling a “sunflower”. In this model, a single retailer facing a large group of consumers also shows a “sunflower” sales pattern.

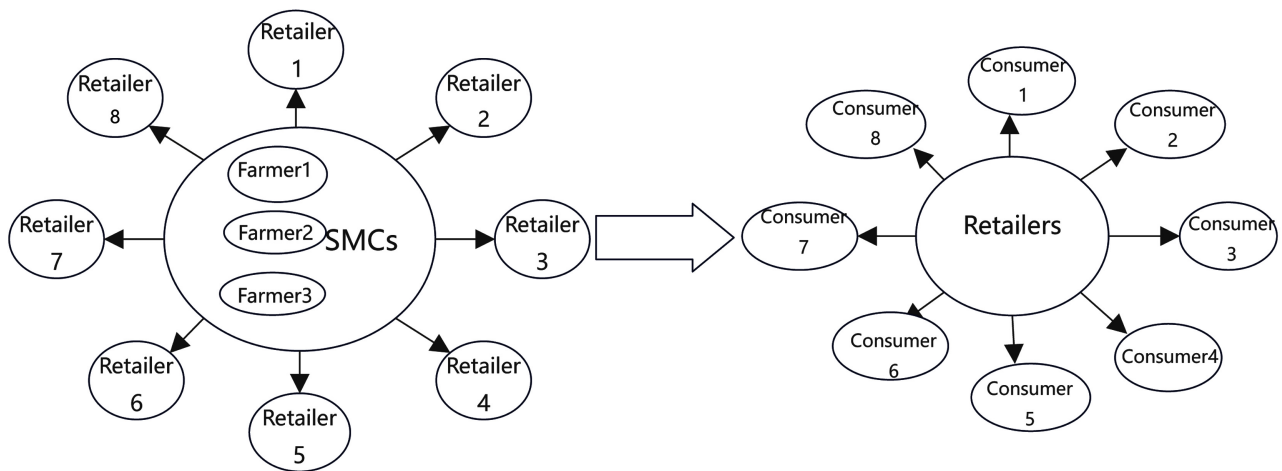


Figure 2. The sunflower model.

This model takes supply and marketing cooperatives as the core, spreads out to retailers, and individual retailers further spread out to consumers, gradually forming a complete agricultural product distribution model. The wide distribution of retailers provides consumers with more purchasing channels. Consumers can easily purchase agricultural products at their doorstep supermarkets or convenience stores, boosting sales of agricultural products and further expanding sales categories. This model is particularly suitable for urban consumers, meeting their needs for convenience and immediacy.

In the case of the “Donggang Strawberry” in Dandong, Liaoning Province, for example, the Dandong Farmers’ Specialized Cooperative significantly improved its economic efficiency through the introduction of its own branding and strawberry early cultivation techniques by the local supply and marketing cooperative and the implementation of the “cost-sharing-wholesale-price-coordination” pact. In the decentralized decision-making scenario without these improvements, the cooperative’s online and offline strawberry sales prices were RMB 188.5 and RMB 151.7, respectively, with a total system profit of RMB 64,741. With centralized decision making and the application of the above improvements, the online and offline strawberry selling prices increased to \$241 and \$205.8, respectively, and the total system profit jumped to \$68223.5. By further adopting the “cost-sharing-wholesale price coordination” contract, the cooperative’s profit reaches RMB 46804.57 and the retailer’s profit is RMB 22401.85, and the overall profit of the supply chain increases significantly. It can be seen that these strategies not only improved strawberry quality and market demand, but also significantly increased the profitability of the cooperative and the entire supply chain. That is, the supply and marketing cooperatives in the area share costs with retailers and thus obtain higher returns are of value and importance in realizing supply chain coordination (Yu & Liu, 2022).

This model is applicable to North China (e.g., Hebei, Shanxi) and Northeast China (e.g., Heilongjiang, Jilin). North China has a high degree of agricultural

scale and is suitable for growing bulk agricultural products such as wheat and corn. The Sunflower model is able to realize large-scale sales of agricultural products by centralizing and integrating agricultural products through supply and marketing cooperatives and uniformly supplying them to retailers (e.g., supermarket chains and convenience stores). The Northeast region is an important food production base in China, suitable for growing crops such as soybeans and rice, as well as producing temperate fruits and vegetables. The Sunflower model enables rapid distribution of agricultural products to the national market through cooperation between supply and marketing cooperatives and retailers.

3) Farmers + marketing cooperatives + wholesalers + retailers + consumers: the barbell model (see **Figure 3**).

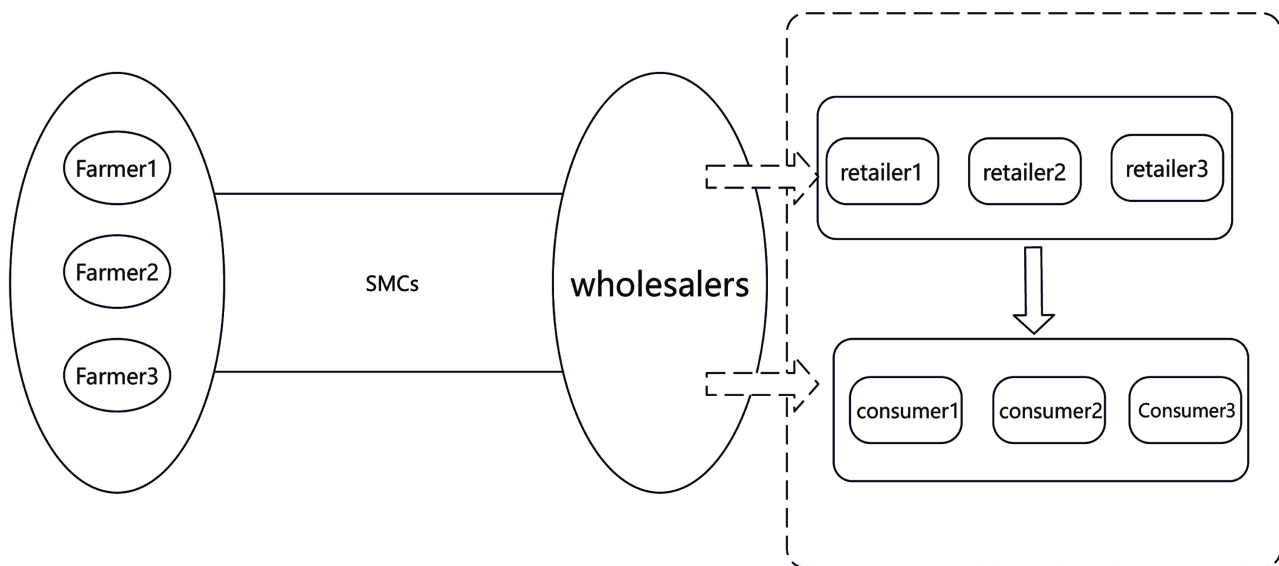


Figure 3. The barbell model.

In the “farmers + supply and marketing cooperatives + wholesalers + retailers + consumers” model, agricultural products, which are produced by a vast number of small-scale farmers, are initially purchased and consolidated by supply and marketing cooperatives. Subsequently, these products are distributed to the wholesale market via wholesalers. Within the wholesale market, agricultural products have the option of being sold directly to consumers or reaching them indirectly through retailers. Throughout this entire process, the seamless cooperation between supply and marketing plays a crucial role. Cooperatives and wholesalers constitute a key hub, connecting numerous small-scale farmers and creating a “barbell-type” transmission mechanism. The wholesalers then interface with a large number of retailers and consumers to achieve wide distribution of agricultural products.

Supply and marketing cooperatives actively promote the upgrading and improvement of the wholesale market for agricultural products, and continuously build new types of agricultural product collection markets, storage facilities, and

modern logistics centers and other facilities and equipment, and by opening up the “initial kilometers” and “last kilometers” of the circulation of agricultural products, to By opening up the “first kilometer” and “last kilometer” of the circulation of agricultural products, we can effectively solve the dilemma of “expensive to buy and difficult to sell” of agricultural products (Zhang et al., 2021), guarantee the safe and stable supply of agricultural products, vigorously promote the process of modernization of agriculture, enhance the added value of agricultural products, and increase the level of farmers’ income (Qian & Xu, 2020). In addition, according to the Guidance of the Ministry of Commerce on Accelerating the Construction of the Circulation System for Agricultural Products, the centralized purchase and unified sales by supply and marketing cooperatives can control the price fluctuation of agricultural products to a certain extent, which will ultimately benefit consumers. The wide distribution of wholesale markets and a strong logistics network enable agricultural products to quickly enter retail terminals around the world, providing consumers with more retail purchase channels.

Tianchang City, Anhui Province, as an example of WoHo cooperatives, in order to avoid “grain without market” “market without price” situation, the cooperative vigorously implement order farming, has with Anhui toms shoes for sale rice, Tianchang City, Hongyuan grain and oil and other food processing enterprises to establish order planting cooperative relations The order area of 50,000 mu. To rice, for example, the order purchase price of 1.4 yuan, higher than the market price of 0.3 yuan/kg, mu average income of nearly 200 yuan. In 2022, the cooperative contacted the Northern Wheat Trading Market and a number of grain enterprises to come to the research of high-quality gluten wheat market, signed 15,000 acres of “Town Wheat 12” orders, and to take the “Order price guaranteed purchase + dividend” mode. Wheat orders guaranteed price of 3 yuan/kg, the final selling price is 3.1 yuan/kg, a premium of 0.1 yuan/kg, the premium part of the proceeds from the cooperative and the farmers in half, farmers increased income of 35 yuan per acre. The cooperative promotes the food industry green, intelligent, order-based, branded development, industrial upgrading, the main body of the development, collective economic growth, farmers income multi-win, leading small farmers to accelerate the integration of modern agricultural development track.

The model is applicable to the northwest region (such as Shaanxi, Gansu) and east China (such as Anhui, Shandong). Northwest China has an arid climate and is suitable for growing specialty agricultural products such as apples and wolfberries. The barbell model, through cooperation between supply and marketing cooperatives and wholesalers, is able to centralize the transportation of specialty agricultural products to the wholesale market and then distribute them to the whole country through retailers. For example, apples from Shaanxi have successfully entered the eastern seaboard through cooperation between supply and marketing cooperatives and wholesale markets. East China, such as Shandong Province, is a major agricultural province in China, and its grain, vegetable and fruit, meat, egg and milk, aquatic products production and other indicators account for a rela-

tively large proportion of the country, that is, to meet the needs of wholesalers to purchase large quantities. In the barbell model, supply and marketing cooperatives cooperate with wholesalers to broaden sales channels, enable broader market coverage and stabilize sales groups.

4) Farmers + Supply and Marketing Cooperatives + Leading Enterprises: Ternary Symbiosis Model (see **Figure 4**).

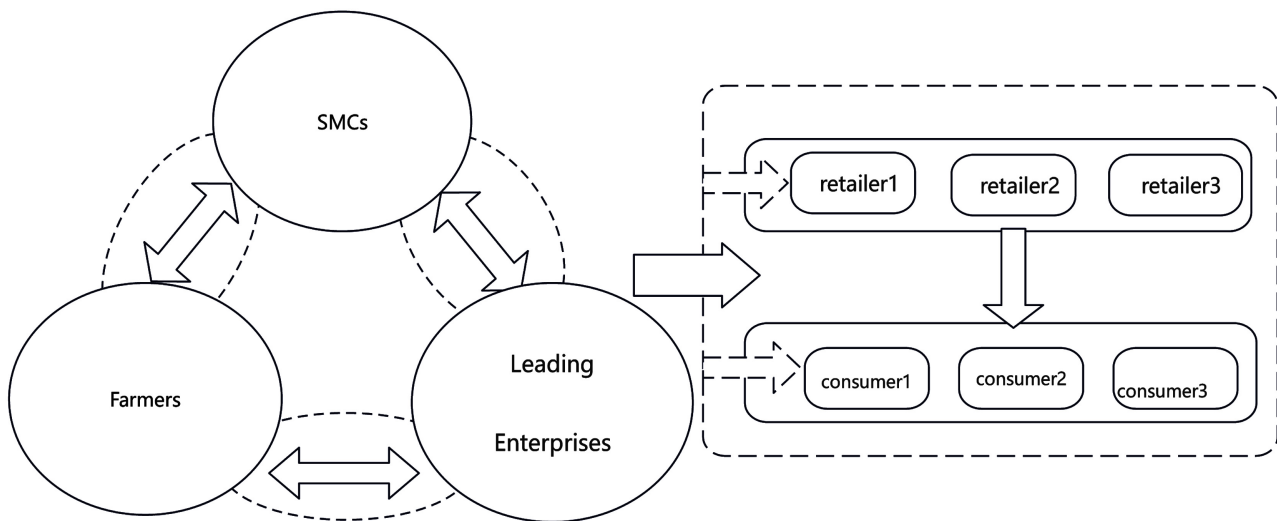


Figure 4. Ternary symbiosis model.

In this model, farmers, supply and marketing cooperatives and leading enterprises cooperate and synergize with each other. In order to expand the distribution channels of agricultural products and expand the scale of the industry, the supply and marketing cooperatives introduce leading enterprises with strong market influence, and the leading enterprises lead the sales work. Farmers can either dock directly with the leading enterprises or cooperate with them through the centralized and unified organization of the supply and marketing cooperatives.

Supply and marketing cooperatives communicate and negotiate with leading enterprises on behalf of farmers, and sign agreements on the production and purchase of agricultural products. On the one hand, because supply and marketing cooperatives have strong bargaining power and market influence, they can help farmers better grasp the dynamics of market demand and reasonably adjust the supply and price of agricultural products, thus enabling farmers to obtain higher product value and increase their income (Huang, 2024). Under the organization of supply and marketing cooperatives, Decentralized farmers can produce based on market demand, while supply and marketing cooperatives offer unified procurement, technical guidance, sales channels, and other services, thereby significantly enhancing farmers' organizational level and production efficiency, preventing disorderly competition among small farmers, and mitigating their market risks.

On the other hand, according to the Ministry of Agriculture and Rural Affairs' Guiding Opinions on Promoting the Development of Agricultural Industrialization Consortia, cooperation between farmers and leading enterprises makes the production of agricultural products more scalable and standardized, improves product quality, and at the same time reduces the intermediary links and lowers costs. In addition, leading enterprises usually have strong market influence and extensive sales networks, and consumers can purchase agricultural products through the brand channels of leading enterprises. The work of supply and marketing cooperatives in brand cultivation can help to enhance the popularity and reputation of agricultural products, strengthen consumers' willingness to buy, and further increase the added value of agricultural products (Huang, 2024).

Changshu Yusheng Agricultural Supply and Marketing Cooperative in Changshu City, Jiangsu Province, for example, where the cooperative takes the lead in forming the Changshu Yusheng Agricultural Industrialization Consortium with regional leading enterprises, farmers' cooperatives, and large planting families, and expanding sales through internal and external co-ordination. The cooperative meets the listing standards of rice 1/4 domestic sales to cooperative members, 3/4 exported to enterprises and institutions, shopping malls and supermarkets. Domestic sales, take "vouchers + preferential purchase" approach, the cooperative every two years to members of the farmers issued 10 kg rice vouchers, as a dividend in kind, members of the vouchers can be close to the receipt of fresh rice; more than 10 kg, the members can be lower than the market price of 0.4 yuan/kg of the price of the purchase, which not only helps the cooperative lock the stable consumer group This not only helps the cooperative lock in a stable consumer group, but also actually benefits the members. Export, on the basis of traditional channels, and actively develop the "Internet + agriculture" market, the establishment of the enterprise WeChat public number, timely release of product information; stationed in the major e-commerce platforms, to build online and offline multi-channel sales network. The cooperative in the national minimum purchase price of rice on the basis of a price increase of 0.3 - 0.4 yuan/kg for settlement, even in the lower price of grain in the year can also be better to protect the income of grain farmers. 2022, the cooperative storage of 5280 tons of rice, drying 12,000 tons of grain, processing of 3680 tons of rice, to achieve 25.75 million yuan of operating income. At the same time, the cooperative has benefited the farmers by issuing rice vouchers, low-priced domestic sales and other forms of benefits, and the rice issued in the form of rice vouchers to the members of the farmers has grown from 150 tons in 2013 to 875 tons in 2022. In addition, villagers under the jurisdiction of the seven village collectives that are members of the cooperative's group are entitled to low-priced ordering of rice, and the cumulative savings in expenditure on rice purchases by farmers from 2013 to 2022 will amount to 2.24 million yuan. By continuously improving the cooperative's ability to provide specialized socialized services to the outside world, Yusheng Cooperative's income-generating channels have been broadened.

The model is applicable to Southwest China (e.g., Sichuan, Chongqing) and East China (e.g., Jiangsu, Zhejiang). The southwest region is rich in agricultural resources and suitable for the development of specialty agriculture. Through cooperation between supply and marketing cooperatives and leading enterprises, the triad model is able to realize branding and large-scale sales of agricultural products. For example, the citrus industry in Sichuan, through cooperation between supply and marketing cooperatives and leading enterprises, has successfully created the “Sichuan Citrus” brand and entered the international market. East China has a high degree of agricultural diversification and is suitable for the development of high value-added agricultural products. The triple symbiosis model, through cooperation between supply and marketing cooperatives and leading enterprises, can enhance the market competitiveness of agricultural products.

4.2. Comparison of the Modes of Supply and Marketing Cooperatives in Promoting the Modernization of the Distribution System for Agricultural Products

1) Level of efficiency in the distribution of agricultural products

The “Three Rivers Diversion” model: By leveraging e-commerce platforms, the “Three Rivers Diversion” model transcends geographical boundaries, broadening its sales reach. Agricultural products are then marketed directly to consumers nationwide and even globally through third-party e-commerce platforms like Jingdong, Taobao, and Jinduoduo., and with the help of social e-commerce multi-channel sales to increase the stickiness of consumers and the frequency of purchases.

The “sunflower” model exhibits weak risk-resistance and is significantly impacted by fluctuations in market supply and demand. The report titled “The Current Situation, Problems and Policy Recommendations of the Modern Circulation System for Agricultural Products” highlights that “supply and marketing cooperatives and retailers maintain a loose cooperative relationship, devoid of a tight benefit linkage mechanism and a solid foundation of trust, making them susceptible to evading responsibilities and acting independently amidst market fluctuations”. and that fluctuations in the prices of agricultural products have a direct impact on their earnings, and that retailers face a greater risk of losing money when the market price rises. As evidenced by the latest financial reports from major retailers such as Amazon and Walmart, market price increases have led to significant profit growth, with Amazon’s net income surging by over \$1.2 billion in 2021 and Walmart’s net income increasing by \$160 million in the same year. Conversely, when market prices fall, retailers and supply cooperatives may face increased risk of loss, as seen in the strategies employed by companies like Target, which adjusts online prices based on local markets to maximize sales and profits.

“Barbell” model: strong market flexibility. Wholesalers maintain a tight connection with upstream and downstream markets, enabling them to swiftly adjust supplies and prices in response to local market demands. However, this model

exhibits reduced circulation efficiency and incurs higher operational costs. It is difficult to coordinate because it involves multiple subjects and links, each with different interest objectives. The absence of close cooperative relationships and effective communication mechanisms among supply and marketing cooperatives, Wholesalers and retailers significantly impact the operational efficiency of the entire distribution model.

“Ternary symbiosis” model: farmers, supply and marketing cooperatives and leading enterprises share benefits and risks, forming an industrial consortium. The three main bodies leverage their respective strengths to enhance both individual and overall economic and social benefits. They not only assist supply and marketing cooperatives in overcoming sales challenges, but also fulfill the supply demands of leading enterprises and help farmers diversify their income sources, thereby increasing their income.

2) Organization and management of agricultural product distribution

The “three rivers diversion” model: a combination of online and offline approaches. Supply and marketing cooperatives sell agricultural products directly to consumers at farmers’ markets, while cooperating with social e-commerce platforms and third-party e-commerce companies to meet consumers’ multi-level and multi-disciplinary needs. With the help of WeChat, Jittery, microblogging and social e-commerce platforms such as Shutterbug, real-time display of product information to attract consumers, through Jingdong, Taobao, Pinduoduo and other third-party e-commerce platforms to realize the base of the direct delivery to reduce logistics and warehousing costs.

The “sunflower” model represents a trend towards disintermediation. Supply and marketing cooperatives provide products directly to retailers. For instance, in the “agricultural-supermarket docking” model, supermarkets connect directly with supply and marketing cooperatives, minimizing intermediate steps, eliminating multiple markups, and lowering the distribution costs of agricultural products.

The “barbell” model: there are many links in the circulation, and the circulation of agricultural products takes a long time. This model involves transportation and storage of supply and marketing cooperatives, wholesalers, retailers and other links, which increases the complexity and time cost of logistics, and The handling, storage, and other operations in the agricultural product supply chain, as per national standards, are prone to cause loss of agricultural products and increase resource waste, reducing efficiency. the circulation, thereby increasing the overall cost of circulation.

“Ternary symbiosis” model: three main bodies collaborate based on resource endowment and advantageous division of labor, ensuring rational arrangement of resource utilization, effective income risk disposal, and other factors, to ultimately maximize resource allocation efficiency. In this model, the leading enterprises play a leading role, by virtue of their far-reaching influence, high brand awareness and strong strength, effectively drive the surrounding farmers to plant agricultural products, and drive more enterprises to cooperate with the supply and marketing

cooperatives.

3) Facilities and technologies related to the distribution of agricultural products

The “three rivers diversion” model: with the help of e-commerce platforms and other technologies, local infrastructure construction faces technical obstacles. Relying on efficient informatization systems, including online trading platforms, order management systems, inventory management systems, etc., requires stable and reliable network support. However, the low level of informatization in rural areas and incomplete network coverage hinder their promotion and application. Cooperation with third-party e-commerce platforms requires certain technical capabilities, such as store construction, product display, online payment, customer management, etc. Farmers and cooperatives need to master these technologies in order to effectively utilize e-commerce platforms for sales (Yang, 2024).

The “Sunflower” model: lower requirements for agricultural product distribution facilities and technology. This model reduces intermediate circulation and warehousing, eliminating the need for a complex logistics and distribution network and a large number of warehousing facilities, and reducing dependence on logistics infrastructure. For instance, specialty stores, supermarkets, and convenience stores dealing in agricultural products can adjust their storage and display space flexibly, without the necessity for or large-scale remodeling and upgrading.

“Barbell” model: Lower requirements for agricultural distribution facilities and technology. Supply and marketing cooperatives centralize the sale of agricultural products to wholesalers, who in turn decentralize sales to retailers, reducing reliance on complex logistics and distribution networks. Supply and marketing cooperatives only need to centralize purchasing and preliminary processing at a fixed location, with wholesalers sorting and distributing in warehouses, and then retailers selling to consumers. Communication of information among supply and marketing cooperatives, wholesalers, and retailers remains straightforward and necessitates no elaborate information technology system; Order management and the exchange of information can be facilitated through telephone calls, faxes, or a basic electronic ordering system.

“Ternary symbiosis” model: Leading enterprises possess a solid technical foundation, yet their logistics construction still requires enhancement. Enterprises primarily depend on social logistics to fulfill their transportation demands, which are influenced by market fluctuations. The issues of significant capital investment and extended time-consumption in self-built logistics have hindered the progress of logistics construction. Certain agricultural products have stringent transportation requirements and preservation, the utilization efficiency of self-constructed logistics remains low, while a majority of social enterprises continue to depend on third-party logistics services (Deng, 2023).

5. Conclusion

In the context of the new era, supply and marketing cooperatives play an im-

portant role in promoting the modernization of the distribution system of agricultural products. Through field surveys and field interviews, this paper analyzes in-depth the practice models of supply and marketing cooperatives in many places, and compares and analyzes the “Three Rivers Diversion”, “Sunflower”, “Barbell” and “Ternary symbiosis” models in terms of the level of efficiency of agricultural product circulation, organization and operation methods, and related facilities and technologies. The “three rivers diversion” model, “sunflower” model, “barbell” model and “Ternary symbiosis” model were comparatively analyzed from three dimensions. The study finds that different models have their own advantages and disadvantages. For example, the “Three rivers diversion” model is outstanding in expanding sales scope and enhancing consumer stickiness, but it requires higher infrastructure and technology; the “Sunflower” model reduces costs through disintermediation but has limited anti-risk ability. Similarly, the “Sunflower” model also exhibits weakness in risk resistance; and the “Sunflower” model is a bit weak in terms of anti-risk ability. The “sunflower” model reduces costs through disintermediation, but is slightly insufficient in terms of risk resistance; The “barbell” model boasts strong market flexibility yet encounters challenges in circulation efficiency and cost management; the “ternary symbiosis” model realizes complementary advantages through close cooperation among the key parties, there remains potential for enhancing logistics construction. Moving forward, these models ought to be further explored and refined, fully harnessing the capabilities of supply and marketing cooperatives, with the aim of advancing the modernization and development of agricultural product circulation systems, and ultimately achieving the objectives of boosting farmers’ incomes, benefiting consumers, and modernizing agriculture and the countryside.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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