

Research on the Agricultural Products Supply Chain Model in Sichuan Province under E-commerce Environment

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Abstract. The advancement of e-commerce has not only created more opportunities for the development of agricultural products logistics in Sichuan Province, but also played an important role in upgrading of agricultural products logistics there. At present, the supply chain model of agricultural products in Sichuan Province is also facing the problems of scattered markets, mismatch between production and sales, and backward technology. Therefore, it is necessary to target against the problems facing the logistics mode and e-commerce to adjust the current logistics operation mode and promote the development of agricultural products e-commerce in Sichuan Province. This paper first studies the current situation of agricultural products supply chain in Sichuan Province, then analyzes the opportunities and challenges faced by the e-commerce development there, and finally proposes suggestions for resolving the problems mentioned above so as to help promote the development of agricultural products supply chain model in Sichuan Province.

Keywords: Supply Chain Model, E-commerce Environment, Agricultural Products.

1. Introduction

Sichuan Province has always been an important agricultural production base in China, with a wide variety of agricultural products and abundant production. In recent years, e-commerce has enjoyed rapid development in Sichuan Province, becoming one of the main channels for selling agricultural products. In Sichuan, the development of agricultural products e-commerce relies on that of logistics and supply chain; and they promote each other. As an accelerator of economic development, modern logistics can drive industrial optimization and upgrading. This paper first summarizes the current situation of agricultural products supply chain model in Sichuan Province, then analyzes the opportunities and challenges faced by the e-commerce development there, and finally proposes some suggestions for promoting the development of modern logistics in rural areas and optimizing the production structure of agricultural products.

2. Research on the Status Quo of Agricultural Products Supply Chain Mode in Sichuan Province

2.1 Scattered Wet Markets, High Logistics and Transportation Costs

Sichuan boasts a wide area with complex terrain, with the eastern part being the basin region and the western part being the plateau mountain region. Areas such as the central and eastern parts of Chengdu are economically developed, with complete infrastructure and relatively high-level logistics industry [1]. There are many high-quality agricultural products with local specialty in the western mountainous and plateau areas. However, due to the large differences in terrain, the markets of agricultural products are scattered. Meanwhile, underdeveloped economy and incomplete infrastructure lead to an increase in the cost of transporting agricultural products.

2.2 Unstable Circulation Mode of Agricultural Products, Mismatch between Production and Sales

Compared with prosperous regions in Eastern China, Sichuan started late in logistics development. At present, the development is of low level; the information network construction and modern information technology remain to be improved; e-commerce is still not popularized in rural areas. Besides, since there are more circulation links, there appears the double marginal effect between the

upstream and downstream supply chain of fresh agricultural products (as shown in Figure 1). Such a gap between these information interfaces brings about the bullwhip effect which describes a situation in which the price of final products decided independently is higher than the centrally decided price. This problem makes the services provided by the logistics industry hardly meet the needs of consumers; and the production and sales parties can't obtain relevant information timely.

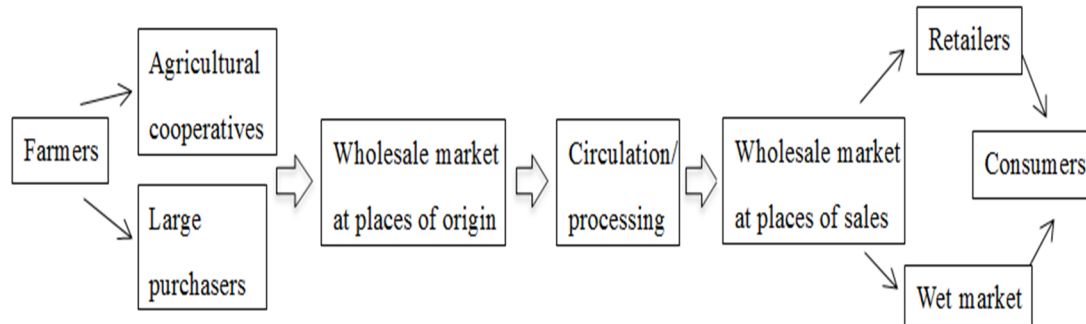


Figure 1. Traditional circulation model of agricultural products

2.3 Backward Transportation, Storage, and Loading and Unloading Technology of Agricultural Products

Most enterprises engaging in agricultural product logistics in Sichuan Province have been transformed from traditional storage and transportation firms, lacking the support of many professional technologies [2]. In terms of transportation, there are few efficient and special transport vehicles; in terms of storage, there is a lack of refrigerating and freezing equipment and storage facilities for agricultural products, which makes fresh agricultural products prone to spoilage and thus difficult to meet the needs of consumers; in terms of loading and unloading, the mechanization and automation are of low level and the packaging is backward and highly depends on manpower. These problems have caused great inconvenience to the transportation of agricultural products.

3. Opportunities and Challenges Facing the Development of Agricultural Products E-commerce in Sichuan Province

3.1 Rapid Development of Agricultural Products E-commerce

In 2018, e-commerce transactions in Sichuan Province exceeded 3 trillion yuan with a year-on-year increase of 19.6%, ranking first in the Midwest. Among them, Sichuan rural online retail sales reached 92.622 billion yuan, ranking the fourth across the country; and agricultural network retail sales reached 16.775 billion yuan, with an increase of 44.26% [3]. Meanwhile, Sichuan government has grasped the development trend of the digital economy and further promoted the “four major projects”. Against such a backdrop, e-commerce industry has maintained a rapid development trend, and e-commerce has seen continuous improvement.

3.2 Diversified E-commerce Modes for Agricultural Products, Continuously Improving Platform

The advancement of e-commerce has reduced the intermediate links in the circulation of agricultural products, which has led to an increase in online sales of agricultural products in Sichuan. There are four main modes of e-commerce in Sichuan Province. The first refers to the e-commerce platforms represented by Taobao and the online stores of special agricultural products. Based on a third-party guaranteed transaction mode, enterprises and individuals are allowed to open stores for free to sell agricultural products online. The second refers to Agricultural e-commerce websites represented by <https://www.zyctd.com/>, <http://www.zgnonggouwang.cn/>, and <http://www.52tongchi.com/>. This is the mode combining the Internet and offline physical stores (O2O) to carry

out professional sales of agricultural products, agricultural materials and fresh agricultural products. The third refers to the e-commerce platforms represented by Alibaba, Jingdong and Chengnong which provide Business-to-Business (B2B) and Business-to-Customer (B2C) marketing relations special for agricultural products with sales services [4]. The fourth is the mode promoting e-commerce service represented by Baidu search marketing. The competitive development of various e-commerce modes has promoted the application of agricultural products e-commerce across the province.

3.3 Challenges Facing the Development of E-commerce

Although rural e-commerce in Sichuan Province has seen rapid development and has broad prospects, it still faces many challenges. Problems such as backward rural information infrastructure and lagging network management still impede the sales and transportation of agricultural products in many rural areas with abundant agricultural products in Sichuan Province. The proportion of those have received formal education in rural areas is lower than that in urban areas, which is not conducive to the popularization of e-commerce there. Moreover, there are also challenges such as the lack of e-commerce talents, poor network marketing capabilities, and poor e-commerce operations.

4. Countermeasures to Optimize Agricultural Products Supply Chain Mode in Sichuan Province under E-commerce Environment

4.1 Using E-commerce Platforms to Promote the Formation of Long-term, Stable Production and Sales Relations between the Markets and Producing Areas of Agricultural Products.

First is to use e-commerce to guide the match between production and sales in agricultural products markets. Terminal sellers such as farmers or agricultural cooperatives can combine sales with e-commerce, appropriately utilize the advantages of e-commerce platforms, and release sales information on the online platform for prospective consumers and buyers. In this way, online and offline production and sales are integrated through multiple channels. It is worthwhile to promote relevant e-commerce enterprises to penetrate western Sichuan and to establish long-term stable production and sales relations with agricultural production areas possessing solid foundations for developing the agricultural industry.

Meanwhile, it's necessary to support the application of various modern information technologies of e-commerce platforms in the whole process of production, processing, circulation and consumption of agricultural products, and the use of relevant technologies for data analysis at the sales end to evaluate and provide optimization feedback for the quality and safety of agricultural products. This enables consumers and buyers to have a better understanding of information relating to agricultural products and order processing.

4.2 Establishing a Stable Logistics Operation Mode under the Supply Chain Environment

It's necessary to promote the construction of a public service system for smart logistics distribution, build a distribution network integrating counties, townships and villages, strengthen the "one kilometer" construction of cold chain logistics of agricultural products, improve the logistics distribution system for agricultural products in economically underdeveloped districts and counties, and further expand the coverage of express delivery outlets.

In addition, it is advisable to construct the integrated warehousing and distribution business based on the information integration of e-commerce platforms. In this way, a consumer or large buyer can send purchase information on an e-commerce platform; then a farmer or agricultural cooperative sends the agricultural products ordered to the storage facility of an adjacent third-party express enterprise; and finally the third-party logistics enterprise is responsible for receiving, delivering, storing of agricultural products and feeding back relevant information. Large agricultural cooperatives or agricultural production bases forecast the sales of different agricultural products in each region according to historical sales data on e-commerce platforms, and issue regional inventory plans to third-party logistics companies based on the forecast results. Based on the regional inventory

plans, the express delivery enterprises will send the products to the regional warehouses designated by each production base or agricultural cooperative for inventory management, and then carry out a series of process operations such as sorting, packaging, distribution, and delivering according to the order information. The specific business process is shown in Figure 2.

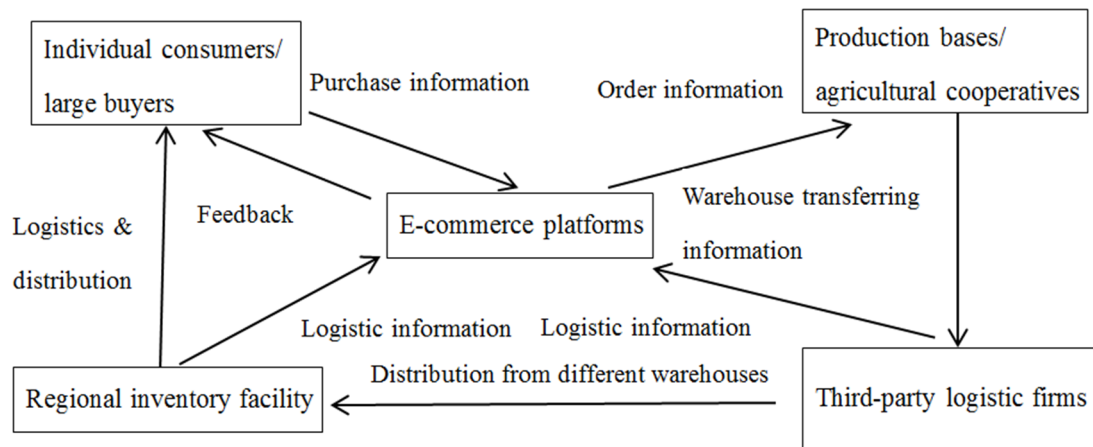


Figure 2. Logistics operation model of agricultural products on e-commerce platforms

4.3 Improving the Technical Level in the Process of Transportation, Storage and Loading and Unloading of Agricultural Products

In terms of transportation, it is necessary to increase the technical investment in special vehicles, and enhance the cold storage capacity of the transport vehicles as well as the protection of agricultural products so as to reduce the spoilage of agricultural products; in terms of storage, it is worthwhile to establish large-scale storage in areas with frequent transactions, improve the level of automatic sorting and transportation efficiency, and increase investment in refrigerated warehouses so as to keep agricultural products as fresh as possible, thus meeting the needs of consumers; in terms of loading and unloading, it's advisable to improve the construction of loading and unloading facilities as well as the level of mechanization, and establish cold-chain facilities such as moderate-scale cold storage as well as processing and assembly centers with the function of refrigeration in production areas, which helps extend the shelf life of products and avoid sales peaks.

4.4 Strengthening the Training and Introduction of E-commerce Talents for Rural Supply Chain in Sichuan Province

At present, Sichuan agricultural products logistics enterprises are extremely lacking professional logistics management talents. First of all, the government of Sichuan Province should formulate certain preferential policies for attracting logistics talents from the logistics supply chain and e-commerce across the country. In addition, local governments can provide professional technical training to relevant employees, thus improving the quantity and overall professional quality of employees. As for logistics and e-commerce enterprises involved in the supply chain, they should pay attention to the cultivation of relevant talents, continuously improve the professional teams for internal supply chain management as well as e-commerce technical teams, and gradually establish a set of top-down system for cultivating talents within the enterprise. As for schools, they should closely follow the needs of the society, provide directional training programs to cultivate high-quality talents in supply chain and e-commerce, and strengthen cooperation with related enterprises to improve students' practical ability.

5. Conclusion

The development of e-commerce has greatly promoted the sales and circulation of agricultural products, thus providing new possibilities for economic development in rural areas. After the analysis of opportunities and challenges faced by the supply of agricultural products in Sichuan, this paper

proposes four suggestions for the further development in this field. First, the present study believes that by promoting the long-term, stable production and sales relations between the markets and production bases, it is conducive to strengthening the circulation of agricultural products. Besides, it is advisable to establish a stable logistics operation mode under the supply chain environment, which can stabilize the transportation of agricultural products and reduce costs. Moreover, it is necessary to improve the technical level of transportation and loading and unloading of agricultural products so as to improve the efficiency and quality of transportation. Finally, it is worthwhile to strengthen the training and introduction of relevant talents so that the agricultural products supply chain under the e-commerce environment in Sichuan can keep developing.

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