

Improving Strategy of Agricultural Products Logistics on the Basis of Supply Chain

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ABSTRACT

With the development of agriculture, rural areas and farmers and rural revitalization, China's agriculture has experienced a rapid development stage. The development of Internet is also changing the marketing methods of agricultural products and promoting the development of rural e-commerce. As one of the pillars of rural e-commerce, it is of great significance to solve its existing problems. This paper studies the problems of agricultural products logistics under the supply chain and puts forward improvement strategies.

Keywords: *Agricultural Products, Logistics, Agricultural Products Logistics, Supply Chain*

1. BACKGROUND OF SCIENTIFIC RESEARCH

As China's logistics started late, is currently in the stage of development, and rural logistics infrastructure is not perfect, so China's agricultural logistics needs to be further improved. At present, the circulation of agricultural products in China mainly flows through the supply chain of farmers, intermediate agents, origin wholesalers, land wholesalers, retailers and consumers. Each supply chain link has its own different subjects. The main body of farmers in China is mainly small farmers with decentralized management.

It is estimated that 400 million tons of about 800 million tons of agricultural products in China need to be circulated through the market every year. The number of streams is huge. Although the overall level of agricultural products logistics in China is not high, the characteristic agricultural products in some regions have formed a relatively stable and relatively perfect logistics system in all links of the whole supply chain from production, processing, packaging to sales.

However, China is in the stage of mediocrity in technology, and it still needs some financial and technical support. With the continuous development of rural logistics, the development of agricultural products logistics will be more rapid.

2. RELATED WORK

With the continuous development of agricultural products and the rapid growth of demand, it is of great significance to analyze the development status of agricultural products logistics and the problems to be solved. Many foreign scholars have studied various aspects of agricultural products and achieved good results.

Md Rakibul Hasan, Abu Hashan Md Mashud and others discussed how to separate near defective products from other excellent products to reduce the damage rate of products, and deduced the algorithm to solve the model. This research is helpful to establish a new pricing and inventory decision model [1]. Food quality and safety is a growing concern of global enterprises. Hany S. El mesery, Hanping Mao and others discussed the application of different nondestructive methods (NDM) for food quality and safety evaluation. It is bright to use NDM to evaluate the quality of food and agricultural products in the future [2]. Vassil sguirev, lyubka doukovska and others proposed an optimal decision-making method with risk for the network transportation of arbitrary configuration of agricultural products, which minimized the transportation cost and covered the emerging risks [3]. Due to the advent of the e-commerce era and the rapid increase in the number of transportation logistics processing, logistics companies need to improve functional vehicle routing measures. Thananut phiboonbanakit, teerayut horamont and others proposed a new optimization model of reinforcement learning and a regression model based on complementary tree [4]. Due to the multi-stage and slow food supply chain process, the deterioration degree of fresh food increases with the passage of time. Muhammad Nasir Mumtaz bhutta et al. Developed a security monitoring and reporting system to update the quality of perishable goods through supply chain management without any human intervention and promote the sustainable development of the supply chain [5-6].

Based on various studies of technical improvement, this paper puts forward the improvement strategies of agricultural product logistics.

3. ANALYSIS OF LOGISTICS PROCESS OF AGRICULTURAL PRODUCTS

China's agricultural products logistics adopts online and offline sales methods, and agricultural products logistics needs to classify orders from the sales source. Off-line sales of farmers are direct sales with leading enterprises, agricultural cooperatives and product

wholesalers. Besides, they also provide direct supply by e-commerce, including fresh supermarkets, fresh e-commerce and some O2O platforms [7]. Besides farmers, there are some other production organizations that consume in some direct-sale outlets or open-air markets. All these sales models need the support of logistics suppliers before they can be delivered to end consumers. As shown in Figure 1.

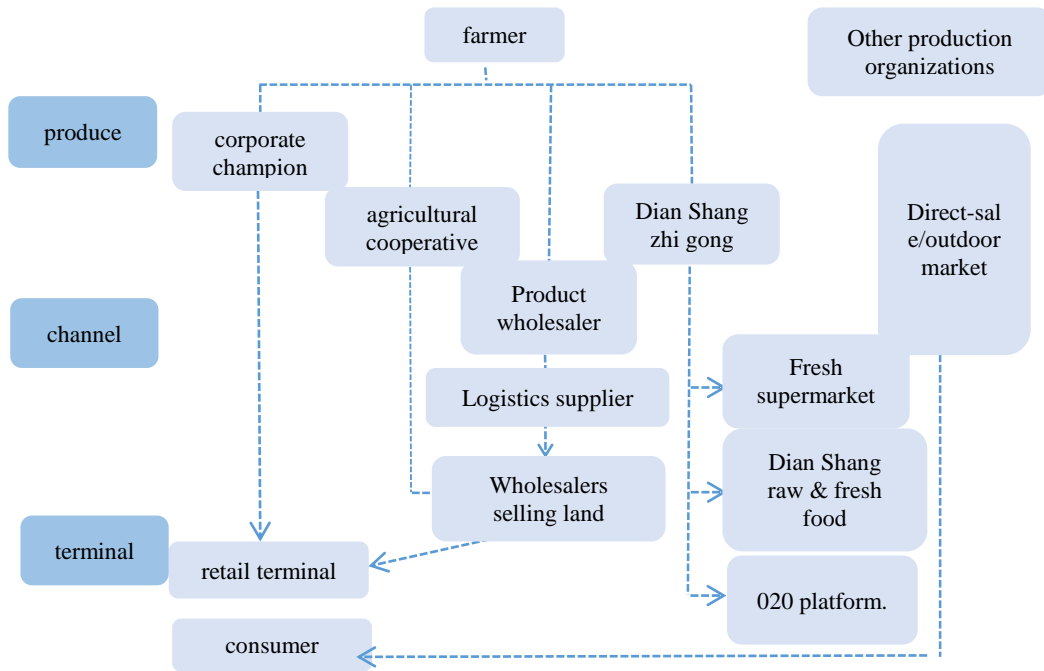


Figure 1. Current situation of circulation of domestic agricultural products

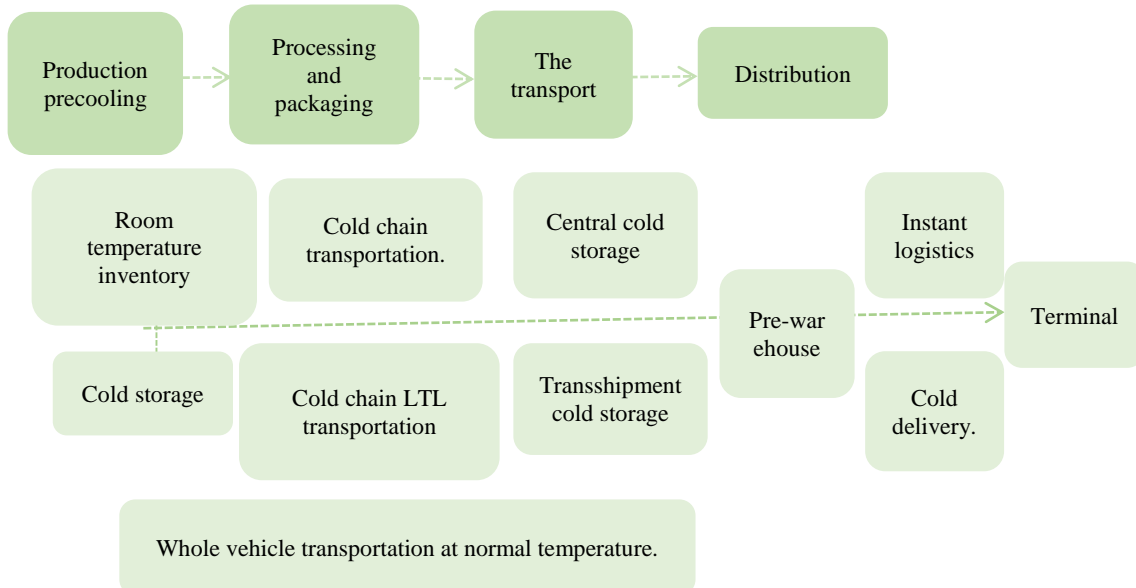


Figure 2. Circulation of cold chain logistics

As shown in Figure 2, Cold chain logistics is an indispensable part of agricultural products logistics, but also the premise of providing quality service for agricultural products. Agricultural products logistics in China mainly includes pre-cooling production,

processing and packaging, transportation and distribution, etc.

4 LOGISTICS ANALYSIS OF AGRICULTURAL PRODUCTS

The logistics of agricultural products has a profound impact on people's lives, affecting all aspects of people's lives from the aspects of logistics cost of agricultural products, infrastructure construction, logistics informationization, cold chain logistics, etc[8-9]. Therefore, the survey of satisfaction of agricultural products logistics is conducive to a better analyzing the problems existing in agricultural products logistics, so as to put forward better improvement strategies. As shown in Table 1

Table 1. Satisfaction survey results

Logistics of agricultural products	Satisfaction.
Logistics cost	2.8
Infrastructure construction of logistics	3.9
Logistics information	3.9
Logistics policy	4.1
Modern logistics consciousness	4.3
Cold chain logistics	3.3

According to the research results, the existing problems of agricultural products logistics are analyzed.

First, the logistics cost is the sum of all kinds of costs consumed in the logistics operation of products from maturity to delivery to consumers, such as transportation, storage, packaging and so on. Logistics costs roughly include storage cost, transportation cost and management cost, among which transportation cost account for 54.70%, accounting for more than half of all costs. According to statistics, China's grain logistics cost accounts for about 30~40% of the total product cost, while fresh agricultural products account for more than 60%. According to the survey, the logistics cost of food in developed countries accounts for 10/20%, and fresh agricultural products account for about 30%. It can be seen that the high flow cost of agricultural products is a problem that should be solved in the flow of agricultural products. The high price of agricultural products is mainly due to the high logistics cost of agricultural products in storage, transportation, packaging, processing, and sales in China. Most of the long-distance agricultural products are in primary form, and the added value of products in the logistics structure of agricultural products is low, which leads to the surplus of agricultural products and prominent structural contradictions. As shown in Figure 3.

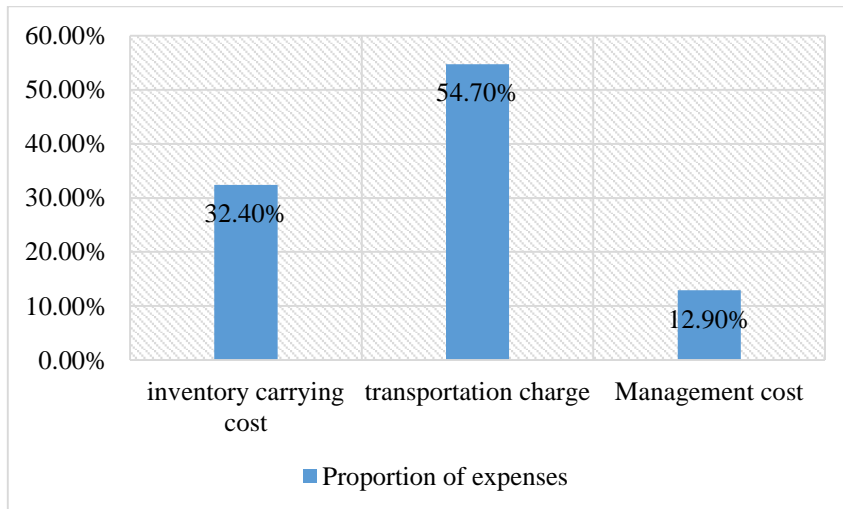


Figure 3. Proportion of logistics costs

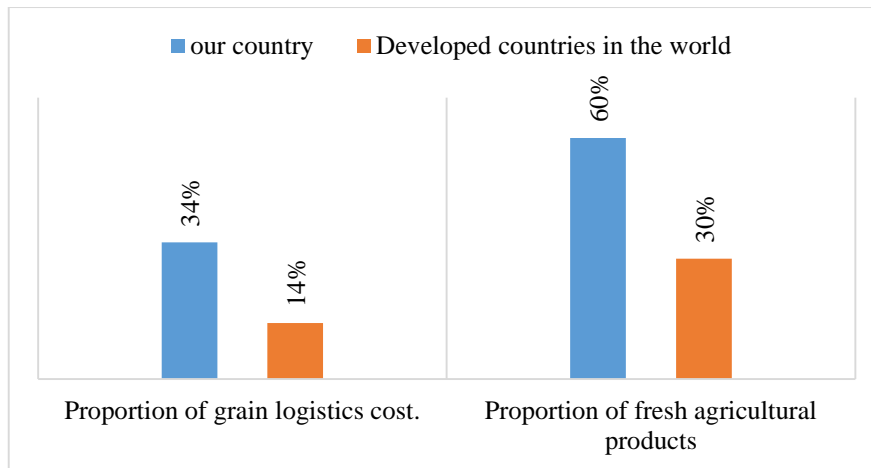


Figure 4. Proportion of logistics cost of agricultural products.

As shown in Figure 4. Secondly, the logistics infrastructure is not perfect. Agricultural products are seasonal, perishable and difficult to preserve, and some agricultural products are also periodic. Because of these natural properties, there are high requirements for their storage, transportation, packaging, handling, circulation and processing. There are no highways in many rural areas of China, and there are no railways in some areas. The highway condition is poor, the traffic is blocked, the mode of transportation is single, and it is not easy to form multimodal transport. Therefore, it is difficult for agricultural products logistics to arrive on time, which increases the logistics cost. In the circulation of agricultural products, most of them need to be treated by classification, drying, fresh keeping, cold storage and anti-corrosion. However, China's logistics facilities and technology in this area are still relatively backward. Thirdly, logistics informatization construction lags behind. Information goes through agricultural products. The efficiency and benefit of agricultural product logistics cannot be separated from the degree of informatization. At present, China's rural information network is imperfect, farmers' awareness rate of the network and rural logistics informatization is low, and farmers' residence are scattered, which makes farmers' access to market information untimely. Fourthly, the logistics policy of agricultural products is not in place. Due to the insufficient supply of logistics policies in rural areas, the process of logistics distribution of agricultural products cannot be standardized. Farmers' lack of trust in the logistics enterprises and the results of logistics outsourcing makes logistics activities difficult to achieve. Without the support of policies, it is difficult for agricultural logistics to meet the needs of economic development. Fifthly, farmers' consciousness of modern logistics is weak. Farmers' understanding of agricultural product logistics is only limited to the production, transportation and storage price of agricultural products. It is not aware of how to reduce logistics, costs and various expenses through the information flow process of the whole process of production, transportation and

sales, which cannot improve the added value of products and increase farmers' income and enterprise competitiveness. The one-sidedness of farmers' understanding and the low education level lead to the slow development of rural logistics in China, which makes the slow development of agricultural product logistics. Finally, The cold chain logistics system is not very complete, so solving the construction problem of cold chain logistics system is the key to the rapid development of agricultural products circulation. Most agricultural products have a short shelf life and fast decay rate [10]. Therefore, we need the support of cold chain logistics to improve the logistics efficiency of agricultural part products and ensure the quality and consumption safety of agricultural products. At present, the cost of cold chain in China is relatively high, it started late, and it is still in a low development stage. The cold chain logistics system is incomplete and the quality of agricultural products cannot be guaranteed.

5. IMPROVE THE LOGISTICS STRATEGIES OF AGRICULTURAL PRODUCTS

Firstly, reduce the logistics cost of agricultural products. Choosing a scientific path to reduce the logistics cost of agricultural products is the main problem that needs to be solved in the circulation of agricultural products in China at the present, and it is of great significance to the development of agricultural products. Only by correctly understanding, accurately calculating and rationally distributing the logistics cost of agricultural product can we continuously reduce the logistics cost of agricultural product. Taking the leading enterprise as an example, suppose that the leading enterprise provides n products or services, has m operations, consumes x resources, and uses to represent the cost of I products, then:

$$C_i = \sum_{i=1}^m M_{ij} Y_{ik} Q_k$$

In which m_{ij} represents the number of job j consumed by product I , and Y_{ik} represents the number of k resources consumed by unit job j ; Q_k stands for the price of k resources. It can be seen from the model that to reduce the cost of an agricultural product, we should start with the activities consumed by the product, the amount of resources consumed by unit activity and the price of unit resources. Reduce unnecessary loss and waste of resources as much as possible, reasonably control resource input, and use as few resources as possible to obtain higher quality services. In addition, from the storage cost analysis: applying the research method of economic order quantity model to agricultural product logistics can effectively reduce the storage cost and reduce the logistics cost of agricultural products. As shown in Figure 5, the more inventory backlog, the higher the storage cost. Therefore, applying the economic order quantity model to find the optimal order quantity is also an effective way to reduce the storage cost.

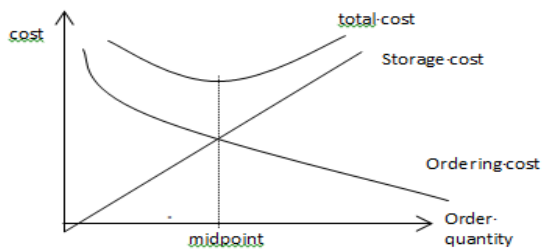


Figure 5. Economic order quantity model

Secondly, improve logistics infrastructure. The key to logistics of agricultural product is to have good logistics facilities. As the saying goes, "build roads before you get rich", and improving roads coverage is one of the important factors for improving logistics facilities. Increasing highway coverage can improve highway grade, service level and transportation capacity. In addition, it also includes. The construction of market research, storage conditions, transportation conditions, tools, etc. of agricultural products, as well as the construction of infrastructure such as after-sales service of agricultural products. Thirdly, accelerate the construction of the logistics information management system. We should increase capital investment and build platforms such as public service information network platform, e-commerce platform, promotion platform and quality and safety platform. By processing all kinds of related information, the logistics sharing degree can be increased, which can provide strategic and decision support for logistics managers to realize the information sharing in the whole industrial chain. Fourthly, strengthen policy support for agricultural product logistics. Starting from China's national conditions, introduce relevant policies, laws and regulations, support the development of rural agricultural product logistics, guide the development of green logistics,

promote the marketization process of agricultural products circulation, improve industry regulations, strengthen management, and create a good competitive environment for various market players[11]. Fifthly, improve farmers' awareness of modern logistics. Development of agricultural products logistics product needs the support of farmers. At present, farmers' understanding of modern logistics is rather vague, and even farmers in some remote areas know nothing about logistics. Enhance farmers' awareness of modern logistics, gradually make farmers' attitude never accept the change of support, and make rural logistics more and more support. Finally, the cold chain logistics system is improved. Safeguarding The quality assurance of agricultural products is a problem worthy of our attention difficulty in agricultural product logistics. Perfecting the cold chain logistics can guarantee the quality of agricultural products[12]. Therefore, we need to build a cold chain logistics system. A cold chain system should be formed from the cold storage of agricultural products origin to the means of distribution and transportation. Therefore, it is necessary to carry out professional management on the cold chain logistics management information system to help the agricultural product logistics develop into a more complete logistics system. To sum up, continuously enhancing farmers' awareness of modern logistics, Pay attention to the improvement of logistics infrastructure and various information systems, increasing capital investment, continuously developing cold chain logistics, and vigorously supporting the development of agricultural product logistics from policy can, to a certain extent, drive the standardization and development of the entire agricultural product logistics.

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