Rural Logistics Distribution Countermeasures

Jiaxin Duan[1], Chenxu Liu[1], Jiabao Bai[2]

[1] Hebei University of Geosciences, Shijiazhuang 050000, Hebei, China
[2] Hebei Professional College of Political Science and Law, Shijiazhuang 050000, Hebei, China

Abstract: The continuous penetration of the Internet into rural areas has driven the development of rural e-commerce. However, in most rural areas of China, the weak infrastructure has greatly hindered the development of logistics and distribution between urban and rural areas. Due to the country's vigorous implementation of the rural revitalization strategy, this paper proposes some optimization suggestions for rural distribution problems based on the ABC inventory classification method and others.

Keywords: rural logistics, distribution, rural e-commerce

1. Introduction

In recent years, rural e-commerce logistics has developed rapidly under the influence of urban e-commerce logistics. For urban and rural residents, being able to buy high-quality agricultural products without leaving home has become a common lifestyle. To smoothly achieve the strategic goal of rural revitalization, many policies and documents have been issued from the national to local levels. In 2024, nine departments including the Ministry of Commerce jointly issued the "Implementation Opinions on Promoting High-Quality Development of Rural E-commerce" (Commercial Circulation Letter [2024] No. 39), proposing 14 specific measures from six aspects. In terms of improving the intensive level of rural logistics and distribution, it is recommended to support various entities such as postal services, supply and marketing cooperatives, e-commerce, express delivery, transportation, and commercial circulation to carry out market-oriented cooperation and provide two-way distribution services for daily consumer goods, agricultural materials going to the countryside (except pesticides), and agricultural products entering cities; promote unified warehousing and joint distribution.

1.1 Development status of rural e-commerce logistics

As of June 2023, the internet penetration rate in urban areas of China stands at 85.1%, while that in rural areas is 60.5%. According to the trend depicted in the graph, the disparity in internet penetration rates between urban and rural areas is gradually narrowing. The internet penetration rates in urban and rural areas over the past three years are presented as shown in Figure 1.
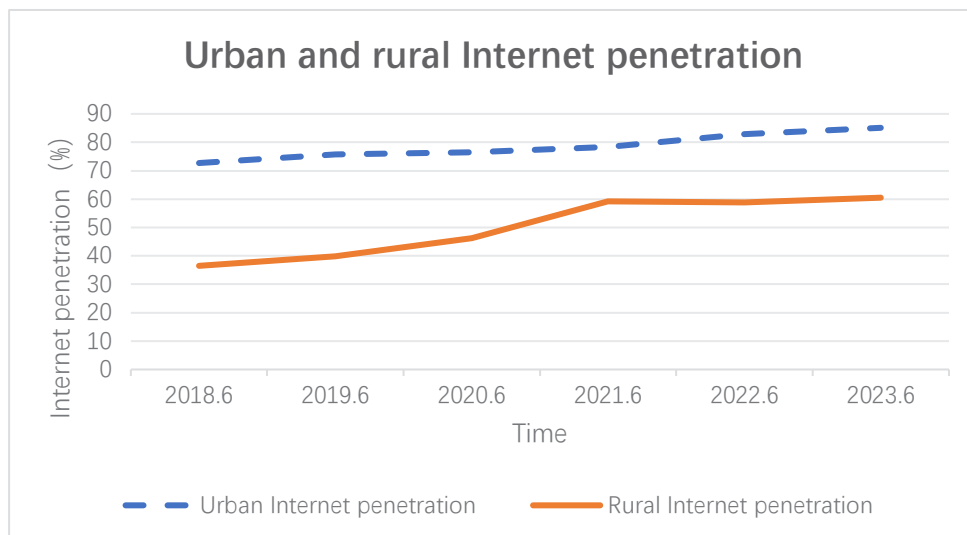

Figure 1. Internet penetration rates in urban and rural areas

In 2023, China's e-commerce market continued to expand and was in a leading position in the global online retail market. According to data from the National Bureau of Statistics, in 2023, the national online retail sales reached 15.42 trillion yuan, a year-on-year increase of 11%. Meanwhile, e-commerce enterprises like Alibaba, JD.com, and Pinduoduo have focused on county-level rural areas. This provides platform support for the development of rural e-commerce and enables more farmers to sell agricultural products through the Internet. In contrast, although rural e-commerce has developed rapidly, rural logistics is relatively lagging. This leads to problems such as inability to transport agricultural products out and difficulty in introducing industrial products. At present, in most rural areas of China, logistics resources are relatively dispersed. Logistics distribution is inefficient, slow, and costly, and it is difficult to effectively meet the diverse needs of rural economic development. There are a total of 289,000 rural postal distribution logistics comprehensive service stations and 190,000 rural post offices across the country. If roughly calculated based on 690,000 administrative villages, 30% of administrative villages do not have rural express delivery stations. This number does not include natural villages and scattered farmers. The development of rural logistics in China seems out of sync with the general trend of economic development.

1.2 The importance of developing rural e-commerce logistics

Many green and pollution-free agricultural products grow in rural areas. However, the sales channels are limited to local areas. E-commerce has opened up new sales channels, making the rural industrial structure more diversified and promoting the upgrading of the rural economy. Developing rural e-commerce logistics can also shorten the distance between urban and rural areas and make the choices of urban residents more diversified. At the same time, rural residents can understand and enjoy modern products in cities, achieving a win-win situation.

2. The predicament of rural e-commerce logistics

2.1 Imperfect rural e-commerce logistics and distribution with high cost

Since the rapid development of rural e-commerce, rural logistics and distribution have made great progress. Generally speaking, the rural logistics and distribution system is still imperfect and there are problems such as lack of overall planning. Rural netizens live scattered lives, with a small number of online shopping items and low transaction amounts, presenting the characteristics of "long logistics chain + low consumption density", increasing the difficulty and cost of rural e-commerce logistics and distribution. At present, rural logistics and distribution in China can generally only reach towns or villages with relatively convenient transportation. Remote mountain villages are difficult to reach effectively and villagers still need to pick up packages by themselves.

2.2 Backward construction of rural e-commerce logistics infrastructure

The construction of rural e-commerce logistics infrastructure is significantly lagging. In remote areas, basic conditions such as warehousing and highway transportation are generally poor, and the configuration level of mechanical equipment is very low. Most agricultural products are seasonal and have large yields. They require low-temperature refrigeration during processing, storage, and transportation. However, the construction of rural cold chain logistics facilities in China is seriously insufficient, resulting in a decline in the quality of agricultural products during the logistics process and affecting consumers' shopping experience of buying agricultural products through e-commerce platforms. In addition, when rural consumers and merchants purchase or sell industrial products, they cannot obtain the distribution information of goods in time, making it difficult to improve distribution efficiency and quality.

3. Suggestions on rural logistics distribution

Delivery end: adopt the ABC classification method for inventory analysis and create a rural intelligent production chain.

The delivery end refers to the party that sends out products. There are still many problems in the "first kilometer" channel for agricultural products from rural areas to cities. One major problem faced by the delivery end is storage. To ensure the freshness of agricultural products that are not sold temporarily and reduce losses during transportation, it is recommended to build agricultural product logistics parks and warehousing and distribution centers in key areas with huge logistics demands. Here, the ABC inventory method is used to conduct further analysis on the storage and transportation issues of agricultural products. The ABC classification method was proposed by the Italian economist Pareto in the 19th century. This method divides inventory materials into three grades A, B, and C according to variety and the amount of funds occupied, corresponding to extremely important, generally important, and unimportant respectively. Then, management and control are carried out respectively for different important grades. Nowadays, it has been widely used in inventory management, cost management, and production management. In this article, we divide the importance of agricultural products into three categories A, B,

and C according to demand and cost, and implement different management and allocation methods. It is hoped that through this classification method, the delivery end can distinguish priorities and implement more targeted management and control of agricultural products in our country. Human daily diet should include cereals and tubers, vegetables, fruits, livestock, poultry, fish, eggs, milk and other foods. According to the Dietary Guidelines for Chinese Residents, the types of agricultural products needed by Chinese residents daily are shown in Table 1. Most of these agricultural products come from the fields and forests in rural areas of our country. We classify agricultural product inventory based on this data.

Table 1. Recommended daily demand for various agricultural products by Chinese residents

	Types of agricultural products	Intake (g)
P1	Grain potato staple food	200-400
P2	vegetable	300-500
P3	fruit	200-350
P4	Livestock and poultry meat	40-75
P5	Eggs	40-50
P6	Aquatic product	40-75
P7	Soybeans and nuts	25-35
P8	Skin milk product	300

Among them, agricultural products such as vegetables, fruits, and cereals and tubers (P1 - P3), as daily necessities that provide energy for the human body, have a large daily intake and are not easy to store for a long time, and the fluctuation range of demand is not large . We take them as the main research objects of this article. Select representative products from these three types of agricultural products and calculate by referring to the relevant prices of Y supermarket. Combined with the demand in Table 3, we assume that cereals and tubers account for 40% of the importance to daily life, vegetables account for 35%, and fruits account for 25%. Use this as a weight and multiply by the actual price to make the result more reasonable. Calculate the weight percentage of each product as the classification basis and make Table 2 according to the ABC classification method.

Table 2. Agricultural products ABC classification summary table

Types of agricultural products	Product name	Unit (yuan/kg)	Amount percentage (%)	Amount accumulated percentage (%)	Weight	Result
P2 vegetable	Tomato	18	12.5	12.5	4.38	A
P2 vegetable	Edamame	16	11.11	23.61	3.89	A
P1 Grain potato staple food	Wheat	12	8.33	31.94	3.33	A
	Corn	11	7.64	39.58	3.06	A
	Sweet potato	10	6.94	46.52	2.78	B
P3 fruit	Apple	16	11.11	57.63	2.78	B
P3 fruit	Pear	14	9.72	67.35	2.43	B
P2 vegetable	Carrot	10	6.94	74.29	2.43	B
P3 fruit	Orange	12	8.33	82.62	2.08	C
P1 Grain potato staple food	Rice	7	4.86	87.48	1.94	C
P2 vegetable	Green vegetables	8	5.56	93.04	1.94	C
P3 fruit	Banana	10	6.94	100.00	1.74	C

It can be calculated that corn, wheat, edamame, and tomatoes together account for the largest proportion of 14.65% and are classified as category A; sweet potatoes, carrots, apples, and pears cumulatively account for 10.42% and are classified as category B; rice, green vegetables, oranges, and bananas account for the least proportion of 7.71% and are classified as category C. After classifying all agricultural products by ABC, hierarchical management can be carried out for inventories of different importance. Category A should be strictly managed and the storage situation should be monitored; category B should be subject to normal control; category C should be given the lowest priority and simple management. See Table 3.

Table 3. Inventory management priorities

Category	A category	B category	C category
Value of agricu-ltural products	High	Normal	Low
Management measure	Strict management	Semi-strict management	Simple management
Storage expenses	High	Higher	Low

In addition, for the construction of warehouses, intelligent technologies such as the Internet of Things and blockchain can be introduced to build unmanned warehousing equipment to solve the problem of missing logistics distribution nodes. Through cloud computing technology, the market demand research and judgment system can be improved, the response ability and scheduling ability of rural logistics can be enhanced, and the goal of upgrading the logistics development level with intelligent technology can be achieved. Given the current situation where farmers produce and sell by themselves and it is difficult to carry out standardized and procedural processing, it is recommended to introduce an intelligent production chain to develop the agricultural industry from traditional and scattered primary product sales to product-oriented and high-quality directions and carry out intensive management of orders. Only when farmers realize the economic benefits after standardizing and regulating the agricultural product distribution process can relevant measures be smoothly carried out. In the early stage, some incentive measures can be taken, such as giving cash and welfare subsidies to encourage farmers to respond to the new agricultural product retail method.

4. Conclusion

Rural revitalization has become the focus of China's economic construction. Building a two-way delivery and distribution system between urban and rural areas allows high-quality agricultural products grown by farmers to go out and high-quality consumer goods to come in, promoting the optimization and upgrading of the rural industrial structure. Therefore, China should vigorously improve the three-level logistics and distribution system at the county, township and village levels and promote the improvement and optimization of urban and rural logistics.

References

[1] Zheng Hui. Analysis of the coordinated development mode of rural e-commerce and logistics under the background of rural revitalization [J]. Shanghai Commercial, 2021, (10): 42-43.
[2] Qian Huimin, He Jiang, Guan Jiao. Evaluation of the logistics coupling effect of "wisdom + Sharing" [J]. Circulation economy in China, 2019, 33 (11): 3-16.
[3] Sun Guohua, Luo Yanfang, Liu Weihua, Zhu Cuiling. Logistics and Supply Chain Management [M]. Beijing: Tsinghua University Press, 2014.

Author Bio

Jiaxin Duan (1997-), female, born in Shijiazhuang, Hebei Province, postgraduate student. Research direction: logistics and supply chain system planning and optimization.

Chenxu Liu (1997-), male, born in Shijiazhuang, Hebei Province, postgraduate student. Research direction: Enterprise operation.

Jiabao Bai (2005-), from Langfang, Hebei Province, is currently an on-campus junior college student. Research direction: international economy and trade.