Operation Mechanism of Agricultural Product Logistics Based on E-commerce Logistics Policy

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Abstract: With the increasing demand of people for agricultural products, the requirements for quality are also rising. Packaging, transportation, storage, distribution and other links of agricultural products are increasingly concerned by society. In order to enrich the existing research on the operation mechanism of agricultural product logistics, this paper briefly introduces the operation mechanism of agricultural product logistics and K-means clustering algorithm. This paper discusses the principal component clustering analysis of data clustering algorithm and the data processing of the questionnaire, and conducts data statistics and analysis on the evaluation results of government support policies and the development of agricultural product logistics under the background of e-commerce logistics policies through the questionnaire method. The survey data shows that 59.3% of people think that the local logistics cost is "high" or "very high", and only 11% think that the logistics cost is low. Therefore, it can be found that the logistics cost is too high under the background of e-commerce logistics policy in this region. Therefore, this paper discusses targeted improvement measures for this problem.

1. Introduction

Promoting the development of modern agricultural logistics system is a huge driving force for building a new socialist countryside, which is of great significance for driving farmers to continuously increase income and ensuring rural consumption safety.

Nowadays, more and more scholars have done a lot of research on the operation mechanism of agricultural product logistics through various technologies and system tools, and have also made certain research achievements through practical research. Through investigation, Envelope A E P found that Weihai's product logistics is lagging behind and there is much room for improvement. Through interviews and literature review, this paper summarizes the current situation and problems of logistics in a city, and puts forward corresponding measures. The survey found that there are many problems in the logistics speed and quality, the most important of which is the inability to meet customer needs. It is better than this city in rich agricultural products, so improving the operation mechanism of agricultural products logistics in this city can promote the continuous

development of modern agricultural products logistics system [1]. Livingston C believes that the transportation mode and time of agricultural products are limited. Because of the characteristics of agricultural products, they need to be transported through cold chain logistics. Therefore, it has become a key way for the development of e-commerce of agricultural products. However, the development of agricultural products is hindered by the problems of logistics facility standards, backward equipment and high transportation costs [2]. Trahan agricultural product e-commerce enterprises urgently need to transform and optimize their cold chain logistics business to maintain their healthy development. Through the field investigation of the agricultural product e-commerce company, the paper analyzes the problems existing in the logistics operation mechanism of the company. Combined with the specific requirements of the supply side structural reform, it proposed measures to promote the technological innovation of logistics operation, optimize the logistics organizational structure and logistics talent support construction, and promote the transformation and optimization of the enterprise's agricultural product logistics operation mechanism [3]. Although the existing research on the operation mechanism of agricultural product logistics is very rich, there are still many problems in its practical application.

Due to poor connection, low efficiency and backward logistics technology of agricultural products logistics. Therefore, on the basis of analyzing the operation mechanism of agricultural products logistics, this paper analyzes the logistics cost of agricultural products under the background of e-commerce logistics policy. It is concluded that the agricultural product upstream logistics chain is too long, the comprehensive logistics cost is high, the overall logistics cost is relatively high, and the high logistics cost limits the price advantage and affects the online sales. Therefore, according to the problems existing in the operation mechanism of agricultural product logistics, this paper probes into the targeted strategic suggestions from the cooperation mechanism and support mechanism.

2. Research on the Design of Agricultural Product Logistics Operation Mechanism Based on E-commerce Logistics Policy

2.1 Operation Mechanism of Agricultural Product Logistics

(1) Talent support mechanism: agricultural product logistics largely depends on the quality of human resources at supply chain nodes and the value creation mechanism of human resources in the supply chain [4].

(2) Cultural support mechanism: the realization of the overall method of the product logistics supply chain of strategic coordination is supported by the organization, the system and norms force people to reach the minimum standard, and the cultural guide people to reach the highest standard. A good agricultural product supply chain culture is a strong support to promote the smooth and efficient development of agricultural product logistics [5].

(3) Standard support mechanism: promote the technical level of product logistics through the formulation and implementation of standard logistics environment, product standards, grading standards, packaging and labeling standards, storage and transportation of agricultural products [6]. Strategic and coordinated product logistics can develop internal standards of product logistics through coordination among nodes to improve the level of agricultural product logistics [7].

(4) Technical support mechanism: comprehensive, integrated and integrated development of all logistics links based on informatization. The level of logistics technology can indirectly affect the development of logistics operation mechanism and the realization of high efficiency [8].

2.2 Impact of E-commerce on Logistics

Information has become the main medium of e-commerce and the main foundation of modern logistics operation. Information can change the operation method and direction of logistics distribution from a new perspective [9]. With the development and support of computer information and Internet of Things technology, logistics distribution has also made information tracking through the Internet, which will make logistics distribution more reasonable [10].

2.3 K-means Clustering Algorithm

The K-means clustering algorithm in this paper uses the European distance between agricultural product logistics data points as the similarity measurement method [11]. The Euclidean distance between two data objects w_u and w_v is expressed as:

$$k(w_u, w_v) = \sqrt{\sum_{m=1}^{n}(w_{um} - w_{vm})^2} \tag{1}$$

The cluster center point is generated by using the average value of the data points in the cluster agricultural product logistics link. Set $S_u = \{w_1, w_2, ..., w_f\}$ as a cluster set, where w_u is a sample point in the cluster set for an agricultural product logistics link [8]. Then the calculation formula for the center point G_u of this cluster set is:

$$G_u = \frac{\sum_{u=1}^{f} w_u}{f} \tag{2}$$

Calculate the summary of each index of the logistics link from the sample data point to the center of the cluster set where it is located.

$$GRE = \sum_{u=1}^{R} \sum_{w \in S_u} \|w - G_u\|^2 \tag{3}$$

In the above formula, w represents the sample data in cluster set S_u, and G_u represents the cluster center of cluster set S_u.

3. Principal Component Cluster Analysis

The model is shown in Figure 1:
Questionnaire Data Processing
120 questionnaires were distributed in this survey, 90 of which were valid and the availability rate was 93.8%.
(1) Enter data. Use the EpiData 3.1 data entry tool to enter the filling information of each valid questionnaire into the EpiData software, and export the data file after the entry.
(2) Statistics summary. In view of the statistical data of agricultural product logistics cost, SPSS statistical software was used for principal component analysis. Import the data into SPSS software, and then conduct principal component analysis.
(3) Score processing. The item "very high, high, average, low, very low" is divided into "10 points, 9 points, 8 points, 7 points, and 6 points". If the statistical score is lower, it means that the public satisfaction of the policy is lower, and further improvement is needed; The higher the statistical score, the higher the satisfaction of the people on the implementation effect of the policy.
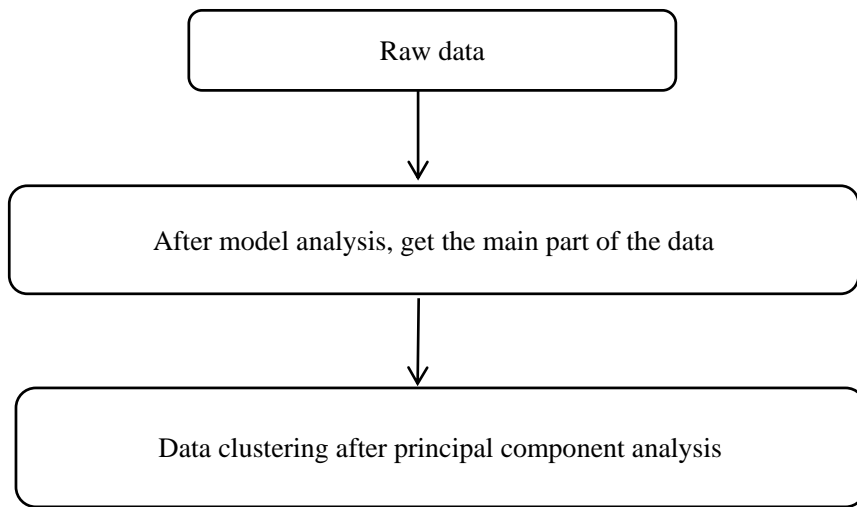
Figure 1: Principal component cluster analysis model

4. Research on the Application of Agricultural Product Logistics Operation Mechanism Based on E-commerce Logistics Policy

4.1 Analysis on Logistics Cost of Agricultural Products in the Context of E-commerce Logistics Policy

The results of the questionnaire survey show that there are still different problems in the logistics operation of a county, mainly in the agricultural product warehousing logistics, capital and talents, logistics costs and other aspects of development are still relatively lacking. Now, the main problems in agricultural product logistics costs are analyzed and summarized as follows Figure 2.
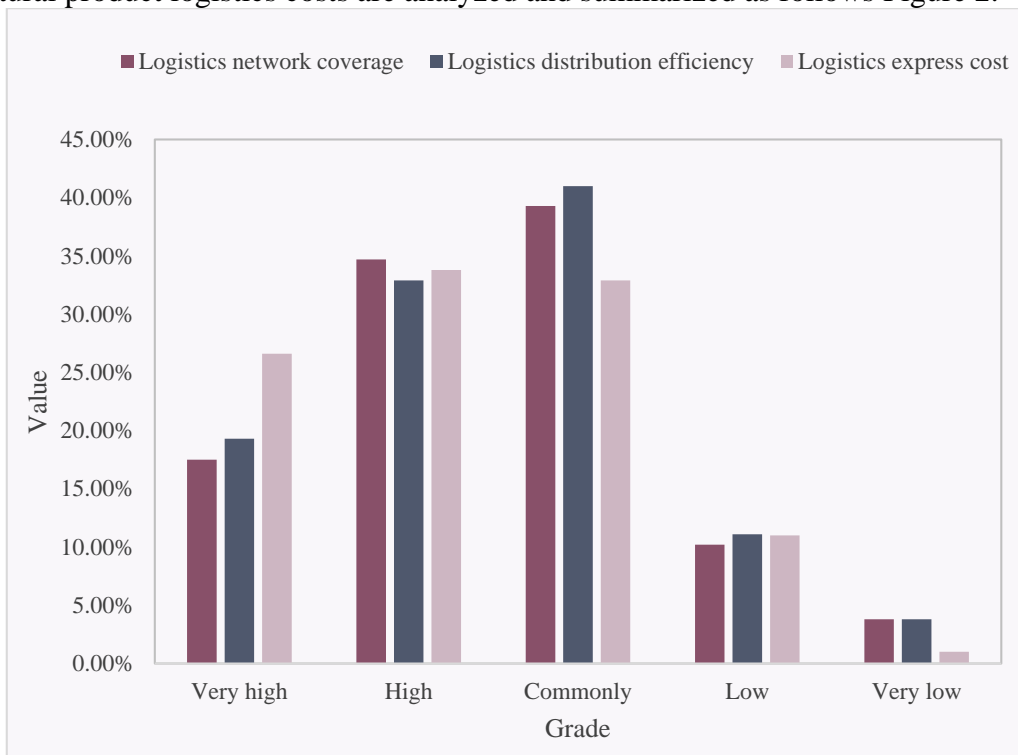

Figure 2: Evaluation results of agricultural product logistics development

According to the evaluation results of the development of the agricultural product logistics link in Table, 89.3% of the respondents in the evaluation of the "logistics network coverage" index gave "average" and above grade evaluations, of which "high" and "very high" evaluations accounted for 51% of the total respondents, indicating that the local logistics network coverage was good. Looking at the efficiency index of logistics distribution, 87.5% of respondents believe that the efficiency of logistics distribution is "average" or above. At present, the problem of local agricultural product logistics mainly lies in the high logistics cost. 59.3% of the respondents think that the local agricultural product logistics cost is "high" or "very high", while only 11% think that the logistics cost is low. No respondents choose the "very low" option.

Table 1: Evaluation results of government support policies for agricultural product logistics

Evaluation grade	Logistics system construction	
	Frequency	percentage
Very high	9	8.3
High	49	44.6
Commonly	37	33.7
Low	14	12.8
Very low	6	5.5

In combination with the evaluation of government support policies, it can be seen from the evaluation results in Table 1 that 51.2% of the respondents gave a high satisfaction evaluation on the construction of the governmen-supported logistics system, and only 17.4% of the respondents gave "low" and "very low" satisfaction evaluations. This shows that most of the agricultural product e-commerce practitioners report high logistics costs, which are mainly due to three aspects:

(1) The integration of local logistics express resources is insufficient, and the overall planning, optimization and utilization of logistics resources are insufficient. The value of primary agricultural products is low, the supply is small and scattered, resulting in a long logistics chain and high comprehensive costs.

(2) There are many primary agricultural products sold on the local network, with low added value and small profit space. The logistics express costs further squeeze the profit space. Therefore, the overall logistics cost is relatively high for single products.

(3) The local government did not provide corresponding subsidies for the e-commerce logistics express link. To some extent, other regions have government subsidies for logistics express costs.

4.2 Suggestions on Operation Mechanism Strategy of Agricultural Product Logistics Based on E-commerce Logistics Policy

Combined with the actual problems of agricultural product logistics operation, especially the problems of low logistics efficiency and high agricultural product logistics cost. Therefore, we should build a modern logistics distribution system and use advanced information means and network technology to transform the traditional circulation mode of agricultural products.

(1) Improve the construction of township logistics infrastructure: increase the broadband coverage of villages and towns, improve the construction of rural roads, and enhance the logistics distribution function of villages and towns; Increase government support, strengthen technical training, and create a good atmosphere for development. Further improve rural broadband coverage.

(2) Strengthen the construction of logistics distribution cooperation mechanism: support logistics and express enterprises to build village-level distribution outlets from the policy level. We will encourage the construction of infrastructure such as cold chain warehousing and logistics that adapt to the online sales of rural products, and develop full cold chain logistics such as pre-cooling at the

origin, refrigerated transportation, cold warehouse warehousing, and customized distribution. The e-commerce express delivery of local agricultural products through the identified warehousing and distribution center will be subject to double discounts on price and service. We will increase funding for water, road, air and information construction.

5. Conclusions

Taking the operation mechanism of agricultural product logistics in a county as the main object of investigation and research, this paper has consulted many literatures on the operation mechanism of agricultural product logistics, accurately grasped the development and research trends of the operation mechanism of agricultural product logistics, designed a questionnaire survey, focused on understanding the reality of the operation mechanism of agricultural product logistics in a county, and closely followed the agricultural product logistics link, This paper analyzes in detail the main problems in the logistics operation mechanism of a county under the background of e-commerce logistics policy, and then briefly analyzes the causes of the problems. Finally, it puts forward countermeasures and suggestions to optimize the agricultural product logistics operation mechanism support policy from two aspects: improving the logistics engineering construction support mechanism and strengthening the logistics distribution cooperation mechanism construction.

Acknowledgements

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