

# A Study on Strategies for the Collaborative Development of Multi-Subject Cross-border E-commerce in Rural Areas

Jingyan Zhang<sup>1,\*</sup>

<sup>1</sup>College of Energy and Mining Engineering, Shandong University of Science and Technology, Qingdao, China

\*Corresponding author

**Abstract:** The integration and collaborative development of cross-border e-commerce and cross-border logistics can break down market barriers between the two industries, improve operational efficiency and benefits, thereby forming the core competitive advantage of China's cross-border e-commerce. This paper analyzes the current situation of cross-border e-commerce, rural cross-border e-commerce, and cross-border logistics. By studying the problems existing in the entire rural cross-border e-commerce system, targeted strategies are proposed for the collaborative development of rural cross-border e-commerce and cross-border logistics. The study finds that the development of the entire rural cross-border e-commerce system is in a high-speed stage, but various entities still face corresponding problems. These include the scarcity of talent with skills in both agriculture and cross-border e-commerce, difficulties in returning and exchanging agricultural products in cross-border logistics, complexity in cross-border payments targeting farmers, and restrictions on agricultural product characteristics in cross-border e-commerce. Therefore, the collaborative development of multi-subjects in rural cross-border e-commerce is necessary. This paper proposes specific targeted strategies for the collaborative development of cross-border e-commerce based on the study of relevant literature and data.

**Keywords:** Rural cross-border e-commerce, Cross-border logistics, Collaborative development, Agricultural products

## 1. Introduction

The government's initiatives of targeted poverty alleviation and the "Belt and Road" initiative have spurred the rapid growth of rural cross-border e-commerce. Cross-border e-commerce platforms serve as connectors between trading entities from different countries, relying on cross-border logistics to ensure smooth transportation. The development of cross-border logistics needs to align with the demands of cross-border e-commerce, enhancing technological capabilities and operational efficiency to drive industry modernization. While cross-border logistics should support e-commerce commitments such as timeliness and after-sales service, it lags behind cross-border e-commerce in development, resulting in mutual constraints. Collaborative development is crucial to promoting the integration of cross-border e-commerce and logistics, breaking down market barriers, and enhancing efficiency and competitiveness. For rural cross-border e-commerce to achieve high-quality development, it requires collaborative efforts from all stakeholders.

In terms of the relationship between cross-border e-commerce and cross-border logistics, Wen Hui [1] believes that due to their mutual Granger causal relationship, logistics and e-commerce mutually inhibit each other in the short term and promote each other in the long term. This conclusion is drawn through Granger causality tests and vector autoregressive model analysis, demonstrating that logistics and e-commerce have a mutual Granger causal relationship. Regarding the synergistic role of cross-border e-commerce and cross-border logistics, Wu Shouxue [2] believes that cross-border e-commerce and cross-border logistics are two important entities in the cross-border e-commerce system, and their synergistic interaction is a favorable condition for the sustainable and stable development of cross-border e-commerce. In terms of the level of collaborative development between the two, Liu Yousheng and Chen Dubin [3] believe that cross-border e-commerce and cross-border logistics are always in a dynamic evolution of mutual competition and cooperation. The level of collaborative development between cross-border e-commerce and cross-border logistics in China is still in the primary stage. This conclusion is based on the study of the collaborative level between cross-border e-commerce and cross-border logistics

using the composite system synergy model. Regarding the logistics mode of cross-border e-commerce, Chen Ting[4] analyzed the diversified logistics mode of cross-border e-commerce in agricultural products and believes that from the perspective of diversified business models, the main business models of cross-border e-commerce in agricultural products mainly include B2B and B2C. Ju Yongmei[5] believes that the risks of choosing third-party logistics in cross-border e-commerce include internal risks and external risks. Internal risks mainly include strategic risks, supply risks, cooperation risks, and information risks, while external risks mainly include transportation risks, packaging and warehousing risks, environmental risks, handling risks, and customs risks. These are the risks faced in cross-border e-commerce and cooperation. Currently, there is a need for further research on the sales characteristics of agricultural products in cross-border e-commerce, the applicability and specific application of cross-border logistics modes, and targeted strategies for the collaborative development of the two in cross-border e-commerce. Therefore, this paper analyzes the current situation and existing problems of rural cross-border e-commerce systems and proposes targeted strategies for the collaborative development of rural cross-border e-commerce involving multiple entities.

## **2. Analysis of the Current Development Status of Multiple Entities**

### ***2.1. Development Status of Cross-border E-commerce***

Analyzing the situation of foreign economic trade over the past decade, according to statistics from the China Statistical Yearbook, the total volume of goods imports and exports has shown an overall stable growth trend, with significant increases in the past two years. According to available data, China's online retail sales of physical goods reached 8.52395 trillion yuan in 2019, representing a 16.5% increase compared to 2018. The combination of these two indicators reflects that China has a solid foundation for the development of cross-border e-commerce.

### ***2.2. Current Development Status of Rural Cross-border E-commerce***

According to statistics from the Ministry of Commerce of China, the total volume of agricultural products imports and exports in China's foreign trade has shown overall stable growth over the past decade, with significant increases in the past two years. The total volume of cross-border agricultural products imports and exports has also shown a stable upward trend. This indicates that both agricultural products import and export trade and the market for rural cross-border e-commerce are vibrant.

### ***2.3. Current Development of Cross-border Logistics***

According to statistics from the Ministry of Commerce of China, in the past decade, the total volume of ocean freight transportation has shown a year-on-year increasing trend. This indicates a significant and continuous growth in the demand for cross-border transportation of goods. Furthermore, it suggests that there is ample room for the development of cross-border logistics, which contributes to the vibrancy of both agricultural products import and export trade and the market for rural cross-border e-commerce.

## **3. Analysis of collaborative development problems**

The problems and obstacles in the coordinated development of rural cross-border e-commerce and cross-border logistics are as follows:

### **(1) The limitation of the scarcity of cross-skill talents in rural cross-border e-commerce**

Compared with urban areas, rural areas are underdeveloped and closed areas, and the main channel for villagers to obtain living income is the transaction in the form of traditional trade. Moreover, because farmers have not received systematic training and lack relevant experience to draw lessons from, the overall quality of agricultural employees needs to be improved. All the above reasons cause that villagers are not proficient in the transaction process of product promotion, order, combination and payment in cross-border e-commerce transactions, and packaging, coding, customs clearance and transportation in cross-border logistics.

Only cross-border e-commerce merchants should have good knowledge related to economy, trade and logistics, and outstanding computer skills, teamwork skills, management and optimization skills, as well as foreign language audio-visual skills. Compared with urban areas, the pace of life in rural areas is

slower and the working and living environment is more difficult.

(2) The limitation of cross-border e-commerce logistics in rural cross-border e-commerce

The requirements of transport and distribution, in the whole transaction process, need to ensure the freshness and timeliness of agricultural products, so the time of transportation and preservation conditions are more restrictive. However, agricultural products need to go through multiple complex circulation links in cross-border logistics, including customs clearance, commodity inspection and distribution, so it is difficult to control the logistics timeliness and transportation loss of agricultural products in cross-border logistics.

In the whole system of cross-border e-commerce, the most difficult factor in cross-border logistics and the most serious factor for consumers to worry about is reverse logistics, which is the after-sales service of return and replacement. Cross-border logistics itself has the characteristics of wide coverage, long circulation cycle, complex transportation and distribution links, and the value of agricultural products itself is not enough to compensate for the logistics cost, coupled with many inherent uncertainties of e-commerce, resulting in the difficulty of after-sales service of rural cross-border e-commerce has risen rapidly. In developed countries that emphasize the rights and interests of consumers, undoubtedly, this has greatly limited the further development of cross-border e-commerce in rural China.

(3) The limitation of cross-border e-commerce platforms in rural cross-border e-commerce

The current development of cross-border e-commerce still remains within the realm of traditional international trade models. Rural cross-border e-commerce operates as a small-scale, high-efficiency mode of decentralized commodity circulation. However, traditional international trade models are inadequate to meet the needs of rural cross-border e-commerce, necessitating innovative economic and trade models.

In rural cross-border e-commerce, farmers are a primary and essential stakeholder. However, due to geographical and infrastructural constraints in rural areas, farmers have relatively limited access to and proficiency in emerging network information technologies. Consequently, many complex technical aspects of cross-border payments are challenging to execute accurately. The predominant structure of agriculture in rural areas, characterized by small-scale, decentralized operations, impedes the efficiency of agricultural labor and hampers the widespread adoption of modern agricultural technologies, thereby hindering the high-quality development of rural cross-border e-commerce.

(4) The limitations of agricultural product characteristics in rural cross-border e-commerce

As food, in import and export trade, consumers will pay more attention to their added value when selecting and purchasing agricultural products, and have stricter requirements on the quality and safety of agricultural products. However, in terms of quality and safety, products are difficult to control during transportation; At present, the domestic and international standards of quality classification are not uniform. In terms of market barriers, in order to prevent dumping and other behaviors and protect the advantages of domestic food, developed countries will set a higher threshold for the importing countries of agricultural products, thus forming trade barriers of agricultural products.

At present, most farmers in rural China mainly focus on planting in agricultural production, and the structure of agricultural production needs to be improved. At present, China's agricultural production mode is still based on small-scale decentralized operation, without realizing large-scale production, so it is difficult to enjoy the scale benefits of agricultural production, which hinders the promotion, application and income generation of modern agricultural technology, and sets an obstacle for the high-quality development of rural cross-border e-commerce.

#### **4. Analysis of countermeasures for coordinated development**

##### ***4.1. Government Perspective on the Coordinated Development of Cross-border E-commerce Among Multiple Entities***

(1) Talent Cultivation and Recruitment

In China, the government should cooperate with universities to cultivate talents related to domestic logistics, warehousing and cross-border e-commerce, encourage professional talents to go to the countryside and give full support and encourage them to stay in the countryside. In terms of training direction, it is necessary to focus on training relevant talents' cognition and mastery of the characteristics

of rural local industries and rural cross-border e-commerce, so that relevant professionals can more quickly integrate into and enhance their loyalty and stickiness in the development of rural cross-border e-commerce. Meanwhile, in rural areas, e-commerce knowledge and network technology should be educated through popular science to improve the overall cultural quality and e-commerce ability of rural workers and cultivate modern farmers. Overseas, the government recruits local talents to manage logistics and e-commerce, and attracts technical talents of cross-border e-commerce and cross-border logistics by means of localized human resources. At the same time, relevant technical and professional quality training activities should be organized for the current employees in the industry, so as to improve the quality of the staff in related work and the overall quality of cross-border e-commerce in rural China.

#### (2) Policy Support and Supervision

The government introduces welfare policies to support cross-border e-commerce enterprises and farmers, actively engaging in cooperation under the Belt and Road Initiative.

### ***4.2. Cross-border Logistics Perspective on the Coordinated Development of Cross-border E-commerce Among Multiple Entities***

#### (1) Technological Enhancement

The characteristics of agricultural products require rural cross-border logistics to establish a professional international transportation and distribution system for agricultural products. This distribution system should ensure two points: one is the low loss of transportation, the other is the high timeliness of distribution.

In transportation, in order to ensure the freshness and low loss of agricultural products, it is necessary to ensure the strict control of transportation conditions such as space and temperature. Cold chain logistics facilities and equipment include refrigerated transportation vehicles and cold storage, and cold chain logistics information system includes global positioning system and intelligent temperature control system.

In distribution, to ensure high timeliness, it is necessary to ensure the smoothness of overseas storage, distribution and transit processes, which can be achieved by establishing overseas warehouses. In terms of functions, overseas warehouse can improve the efficiency and shorten the duration of overseas logistics transportation, storage, sorting and distribution operations, realize overseas localization operations and avoid overseas related risks, so as to reduce overseas logistics costs and the overall cost of rural cross-border e-commerce. Among the five-party transaction subjects, overseas consumers and farmers cannot build overseas warehouses due to resource and cost constraints; Cross-border e-commerce platforms can build overseas warehouses by themselves. Through the construction of overseas warehouses, cross-border logistics enterprise platforms can quickly respond to the needs of overseas consumers, so as to improve satisfaction and shopping experience; Cross-border logistics companies can also provide direct overseas warehousing services. By establishing their own overseas warehouses, cross-border logistics companies can provide a wide range of warehousing, sorting and distribution services to directly facilitate cross-border e-commerce platforms and farmers, so that they do not need to personally participate in the operation of overseas warehouses, but only need to send agricultural products to warehouses, and cross-border logistics companies can directly sort and distribute according to customers' orders. The government can support and guide the construction and sharing of overseas warehouses in terms of overseas warehouses, and formulate corresponding operation and charging standards, interest distribution and guarantee mechanism on the premise of ensuring the realization of the needs of all stakeholders and fair and balanced development.

#### (2) Cross-border Reverse Logistics

Improving cross-border reverse logistics services has become an inevitable requirement for the development of cross-border e-commerce, which requires the joint coordination and efforts of the whole cross-border e-commerce. From the perspective of organizational cooperation, cross-border e-commerce platforms need to provide high-quality and high-level return and exchange services to overseas consumers, and timely feedback to farmers on the return and exchange needs of overseas consumers. Cross-border logistics enterprises should actively communicate and coordinate with farmers, overseas consumers and national customs, so as to maximize the efficiency of reverse logistics; Finally, the relevant departments of the state should optimize the efficiency of customs clearance and reasonable tariff concessions, implement strict order review and multi-dimensional quality supervision for the whole process of agricultural products trading and circulation, and provide certain convenience and inclusive

support measures for reverse logistics.

### (3) Cross-border Logistics Alliance

In order to reduce transportation costs and improve logistics efficiency, cross-border logistics should make use of scale effect and diffusion effect. The process of cross-border e-commerce and cross-border logistics cooperation is the process of commodity circulation. In this circulation, a complex logistics network is required, which has the demand for highly specialized and informationized logistics. Cross-border logistics enterprises are required to abandon the non-standard traditional logistics mode, and on the basis of complete infrastructure construction. At the same time to comply with the uniform service standards and the use of reasonable logistics mode. The above foundation and unification all require the coordination between cross-border e-commerce and cross-border logistics.

The establishment of cross-border logistics alliance by logistics enterprises is one of the important ways to realize cross-border logistics coordination. The effective way to establish cross-border logistics alliance includes two aspects, one is the sharing of infrastructure and other related logistics resources, the other is the close contact and effective connection of cross-border logistics enterprises on the logistics information network.

The integration of logistics resources can be realized by establishing an informationized and interactive cross-border logistics network information platform, which includes transportation tools related to commodity transportation, sorting equipment and warehousing including overseas warehouses, and finally forms an integrated hybrid cross-border logistics mode. The connection on the information network includes the production, sales and storage of agricultural products, the coordination of customs and commodity inspection links, and the standardization of quality testing standards, so as to improve the storage of agricultural products and the timeliness of logistics, reduce the risk of cross-border e-commerce transactions, reduce the tedious and repeated links in the traditional logistics mode, and enhance the competitiveness of cross-border e-commerce in rural areas of our country.

### ***4.3. Cross-border E-commerce Platform Perspective on the Coordinated Development of Cross-border E-commerce Among Multiple Entities***

#### (1) Streamlining Payments

The cross-border e-commerce payment system includes two payment methods: traditional payment and third-party payment. The traditional payment mainly refers to the direct transfer or credit card payment by sellers and consumers with the help of e-commerce platforms and banks. The third-party payment method mainly refers to the collection and payment of goods and logistics expenses by sellers and consumers with the help of e-commerce platforms, banks and third-party payment institutions. In such a transaction process, the safety of capital flow can be guaranteed.

Therefore, streamlining the cross-border payment process is essential in the development of rural cross-border e-commerce. In addition to farmers' own active learning and use of cross-border payment to master the links and processes of payment, the development of cross-border e-commerce payment system also needs the cooperation of other subjects. Firstly, the simplification of payment requires the state to accelerate the introduction of policies to support the evolution of payment platforms and improve supervision to increase the security and credibility of payment platforms. Secondly, cross-border e-commerce platforms should strengthen the review of orders and speed up the processing of receipt and payment, and further promote the cooperation and settlement of third-party payment institutions. Thirdly, banks and third-party payment institutions should analyze and predict users and their account data through new technologies such as big data analysis and the Internet of Things to segment the market, provide differentiated services for different users, and ensure the security and efficiency of payment through the update of payment forms including NFC payment, biometric payment, 24/7 payment and instant arrival.

#### (2) Evaluation and Selection of Third-party Logistics by E-commerce Platforms

Cross-border e-commerce enterprises provide trading platforms for farmers and overseas consumers, and in order to ensure core competitiveness, they generally choose third-party logistics to contract the transportation and distribution of cross-border logistics. In the selection of cross-border logistics enterprises, cross-border e-commerce enterprises should pay attention to cooperation risks, and assess the development potential and core competitiveness of logistics enterprises.

In terms of cooperation risk control, cross-border e-commerce enterprises should first determine the

list of cross-border logistics enterprises that can be selected for cooperation by comparing prices and service quality according to their own needs; Secondly, it is necessary to investigate and evaluate the cooperation risks of cross-border logistics enterprises. The contents of accurate investigation and evaluation include enterprise credit, default rate, information confidentiality, proportion of transportation loss and logistics transportation timeliness, etc. Finally, after determining the cooperative object, we should establish a risk prevention system suitable for it, and refine the management to avoid risks.

In terms of the potential and competitiveness assessment of logistics enterprises: The third-party logistics provider is a diversified business operation. Firstly, it is necessary to determine whether its business capabilities are compatible with the needs of cross-border e-commerce enterprises, and whether the infrastructure can ensure the full play of the core support role. Therefore, it is also necessary to assess the enterprise development goals and the proportion of resource input, and judge the enterprise's "effort level" in this business in the future. Secondly, the "sustainable power" of cross-border e-commerce development is assessed. Under the trend of cross-border agricultural products trading, which is increasing and showing a trend of diversification, whether cross-border logistics enterprises can meet the needs of e-commerce platforms and realize logistics value-added in terms of logistics timeliness guarantee and cost control ability, so as to achieve long-term and stable cooperation with e-commerce platforms is also the key direction to be assessed. Finally, it is necessary to consider the ability of information exchange and communication of cross-border logistics enterprises.

#### ***4.4. Perspective of Individual Farmers or Agricultural Product Production Enterprises on the Coordinated Development of Cross-border E-commerce Among Multiple Entities***

##### **(1) Standardization of Agricultural Product Quality Inspection**

The whole commodity circulation activities of cross-border e-commerce and cross-border logistics coordination involve different product varieties and multiple national subjects with different customs conditions. In order to achieve the coordination between cross-border e-commerce and cross-border logistics, farmers should, under the guidance of the government and the requirements of e-commerce platforms, formulate and implement unified standards for product quality testing and evaluation of agricultural products, and refine specific aspects such as the unification of labeling of agricultural products, the division of quality grades of agricultural products, and the specification of transportation and storage requirements. The unification of such standards is conducive to the coordinated management of agricultural products in quality inspection, sales, preservation, circulation, supervision and after-sales service, and further ensures food safety, logistics timeliness and production feedback.

##### **(2) Mechanization of Agricultural Product Production**

The demand for cross-border e-commerce of agricultural products is increasing day by day, and the demand of cross-border consumers is becoming increasingly diversified. Therefore, in order to improve production level, reduce labor cost and increase economic income, farmers should promote the development of mechanization of agricultural production according to their own actual situation. In the development of agricultural mechanization, first of all, the government needs to carry out the education and promotion of grass-roots production mechanization technology, and increase the strength of policy support, appropriate setting and issuing subsidies for the purchase of agricultural machinery and the scrapping and renewal of old equipment; Secondly, farmers themselves need to take the initiative to learn the operation of new machinery and tools and the operation process of new technology, and can also form a farmer alliance, so as to share expensive agricultural machinery and equipment and reduce the purchase cost. Thirdly, cross-border e-commerce platforms should encourage and promote farmers' intensive production through order setting and purchase price concessions, so as to improve the efficiency and benefit of machinery and tools operation. Finally, cross-border logistics enterprises should ensure that their transportation capacity can meet the logistics needs after the development of agricultural mechanization.

## **5. Conclusions**

This paper conducted an exploratory study on the issues within China's cross-border e-commerce system, analyzing the current development status and existing problems in rural cross-border e-commerce and cross-border logistics. Specific countermeasures and suggestions were proposed for the coordinated development of various stakeholders in rural cross-border e-commerce, providing practical references for relevant theoretical research. However, the proposed strategies in this paper are limited by

research conditions and background, lacking scientific guidance and support in practice.

Future research can build upon this paper by closely integrating the coordinated development of cross-border e-commerce and cross-border logistics with the latest status of the new rural economy.

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