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Research on rural logistics distribution model

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Abstract:

With the continuous expansion of online shopping in rural areas, the number of rural delivery is also increasing, but there are still many problems in the "last kilometer" of rural logistics, which limits agricultural products to rural areas and industrial products to cities, affecting the economic development of rural areas. Through field visits and literature reading, this paper analyzes the problems existing in rural logistics distribution, points out the advantages of crowd sourcing logistics distribution mode, and proposes to use crowd sourcing logistics mode to solve the logistics problems of rural e-commerce under the social mechanism of rural acquaintances. Crowd sourcing logistics distribution mode has some advanced nature and widely used in rural areas. It can solve the problems of distribution efficiency, cost and credit risk.

Keywords: Logistics; Distribution; Rural area; Crowd sourcing

1 Research background

On the afternoon of February 24, 2021, the Information Office of the Chinese State Council held a press conference on the construction of a new development pattern of services and accelerating the high-quality development of Commerce. Wang Wen tao, Minister of Commerce, stressed that the focus of rural construction is to transform the three-level commercial circulation networks in counties and villages and improve the rural commercial system, and said that by 2025, Each county should build a chain of rural logistics distribution centers, express delivery to achieve full coverage and village to village connection, do a good job in sinking in rural areas, and open up the "last kilometer" of rural logistics.

In addition, e-commerce is more and more widely used in rural areas. According to the latest statistics of the Ministry of Commerce, by may 2020, the number of Internet users in China's rural areas has exceeded 200 million. Purchasing daily necessities through e-commerce platform has become the daily life of farmers. More and more network products and services enter the countryside through e-commerce platform, which has changed farmers' living habits and consumption habits, but the existing distribution mode in the rural scene can hardly meet the needs of consumers. The reason is that China's rural logistics development time is short, the logistics distribution system is not perfect, the overall strength of products is not strong, and the infrastructure construction lags behind. Even though China's "Interim Regulations on express delivery" clearly stipulates that express delivery must be delivered to the agreed address and signed by the recipient in person, it is difficult to complete in practical operation due to the pressure of cost. The high cost and low efficiency of rural logistics make the distribution stop in villages and towns and cannot be delivered to households. Therefore, the problem of rural logistics distribution seriously restricts the development of rural economy[1].

2 Question raised

With the continuous promotion of the rural supply side reform by the Chinese government, the rapid development of rural e-commerce has successfully driven agricultural efficiency, farmers' income and rural prosperity, which is enough to lead urban and rural consumption and domestic demand and promote the coordinated development of urban and rural areas. Based on the research, rural e-commerce can increase farmers' income and improve farmers' quality of life. However, China's rural population is sparse, unevenly distributed and the shortage of logistics resources leads to the weak economic foundation and limited logistics

investment in most rural areas. Therefore, the research on how to integrate and make use of existing resources will help farmers generate income, improve farmers' quality of life and improve the efficiency of rural e-commerce logistics services, which is of great practical significance to promote rural poverty alleviation.

2.1 The distribution cost is high

The rural logistics distribution cost can be simplified into transportation cost and labor cost. In terms of transportation costs, statistics show that within 20 kilometers, the distribution cost of a single package in rural areas is twice that in cities. At 60 kilometers, rural areas will be four times as high as urban areas. Most rural areas in China are sparsely populated and far away from urban areas and towns. This phenomenon increases the distance of logistics distribution and the fuel consumption of transportation vehicles. In addition, rural infrastructure conditions are not as good as cities, and roads are not open and flat enough, which also increases the depreciation cost of transportation equipment. In addition, in terms of labor cost, China's residents' wages are rising, the employment cost of logistics distribution personnel is rising, rural residents are scattered, and the delivery time of distribution personnel is long, which indirectly makes the labor cost of rural logistics distribution remain high. According to the calculation of rookie logistics cost, when the number of packages per day at a village logistics point reaches 10 orders, the average cost is 4 yuan per order; Up to 20 orders, the cost will be reduced to 3 yuan. Therefore, the cost of rural logistics is much higher than that of urban logistics.

2.2 Rural infrastructure is backward

Rural logistics activities are the activities of rural commodity circulation, including human, material and technology. Transportation equipment and communication equipment play a great role in the whole logistics process and are the basis of logistics transportation. At present, there are some problems in rural logistics, such as backward infrastructure, incomplete hardware and software facilities and so on. The distribution effect of rural e-commerce logistics deviates significantly from the "Pareto optimal model", and faces many problems, including but not limited to scattered distribution channels, long distribution time and redundant distribution links. The development of rural logistics needs the whole process monitoring information, including packaging, classified transportation and distribution. However, the informational level of rural logistics is low, and most Township express delivery agencies do not have professional equipment. In addition, the mobile signal in rural areas is poor, and the information exchange between different commercial organizations is poor. It is

unable to release logistics information in real time and track the whole process, which is easy to cause goods loss and damage.

2.3 The residence information of farmers is imperfect.

Considering the imperfect rural basic transportation facilities and logistics costs, most logistics enterprises engaged in express business end in villages and towns. Due to the lack of professional agents, the goods cannot be delivered on time. Rural residents cannot realize the door-to-door service of online shopping, and it is difficult for rural residents to experience the convenience of online shopping. Although some rural areas also have e-commerce distribution stations, the residents in rural areas are scattered, and there are no detailed signs of GPS positioning accuracy on rural roads. There are few outlets, the signal is unstable, and the distribution personnel are not familiar with the local situation, so they need to spend a lot of time looking for the customer address.

3 Literature review

3.1 Research status of acquaintance society

Song Lina (2014) believes that interpersonal relationship is a mechanism for dealing with social order, integrating acquaintance society through different levels of social operation such as function satisfaction, social control and value production. According to previous research, in the rural scene, under the influence of human feelings, acquaintance society can be regarded as a micro power network, Therefore, the village is also integrated into a closed community, with less internal disputes and unity with the outside world. Therefore, if mass logistics is introduced into rural areas, consumers' distrust of the platform can be avoided to a certain extent.

3.2 Research status of rural e-commerce

Firstly, the income of farmers is strongly related to the development of rural e-commerce, and logistics services have a great impact on the development of rural economy. Secondly, the factors that promote the development of rural e-commerce include the introduction of talents, infrastructure construction, information technology level and so on.

3.3 Research status of crowd sourcing logistics

Jeff Howell put forward the concept of crowd sourcing as early as 2006, that is, "companies or organizations outsource the work once completed by professionals to non-specific

personnel in a voluntary and free way". Firstly, he combined the concept of fresh crowd sourcing with the concept of e-commerce and proposed the use of fresh crowd sourcing for crowd sourcing distribution. The crowd sourcing mode and traditional mode are compared and analyzed, and the advantages of crowd sourcing mode are summarized.

Bin Hou and Xie Guojie (2020) established an empirical model based on the theory of organizational embedding and trust. The study found that trust has a positive impact on the willingness of carriers to join. By analyzing the literature of previous crowd sourcing logistics platforms, we can find that crowd sourcing is innovative to a certain extent, which provides practical significance for the development strategy of rural crowd sourcing platforms. By studying the analysis of the influencing factors of crowd sourcing logistics platform in various literature, it is found that consumers' trust in the carrier plays an important role in their willingness to participate. Considering consumers' trust preference for carriers is of practical significance. Therefore, based on the existing research and the background of rural acquaintance society, this paper introduces the crowd sourcing logistics model into rural areas, and puts forward some specific suggestions. In this way, it can not only reduce certain logistics pressure and improve farmers' living standards, but also reduce distribution risk and reduce goods damage and difference.

4 Case analysis

4.1 Domestic rural logistics situation

With the rapid development of rural economy, rural network consumption potential is gradually released, and rural e-commerce and express business are developing rapidly. This paper investigates the situation of rural logistics in Suzhou. According to the survey results, more than half of rural residents buy online three to four times a month on average. "Four connections and one arrival" (Yuantong, Zhongtong, Shentong, Baishihuitong, Yunda), Jingdong, Shunfeng, postal and other express enterprises have also gradually arranged in recent years. However, in order to avoid the problem of logistics cost, most enterprises only set up one station in the township, and one station radiates several villages.

Due to the low technical content of terminal distribution, it is difficult to obtain government policy support, so the vast majority of rural township level stations are established through independent applications. Generally, the staff need to pick up the express at the last station at a fixed time, but due to the cost problem, each station basically adopts the service mode of

"free self collection and paid door-to-door".

For rural customers, receiving express delivery has become a "trouble". The residential area is far away from the urban center and the infrastructure is backward. Most customers have a round-trip trip of nearly one hour. Nearly half of the villagers usually contact payment and delivery, and many customers often find acquaintances to receive the goods on their behalf.

According to the survey, the waiting time of rural residents for express delivery will be delayed by 2 days or more after the goods are transported to the township level station in 3-4 days. The reason for the long-term delay of distribution is that the major logistics companies have a large radiation range of each stop point, many repeated construction phenomena, serious waste, large daily average receiving and dispatching volume, and limited matched logistics human and material resources, so it is difficult to respond in time and quickly.

Under normal circumstances, consumers believe that the door-to-door service of express delivery below 5 yuan is acceptable. However, the damaged express delivery, poor service attitude and untimely update of logistics information in the distribution process have also brought bad service experience to customers. The vast majority of rural customers are willing to install relevant mobile phone software to timely view logistics information and pay for high-quality distribution. This shows that the price elasticity and compatibility of distribution in rural areas are good, and there is a strong demand to improve the quality of terminal distribution service.

4.2 Foreign rural logistics situation

In western countries, rural logistics and distribution developed earlier, with good infrastructure such as transportation and communication, and high level of information and specialization. At the same time, the population of developed countries is relatively small, and some countries have a vast territory, which is similar to the demand of rural logistics distribution in Suzhou, so it has reference significance.

4.2.1 Rural logistics in Japan

In recent years, the Japanese government has strongly supported rural areas to adapt to the increasingly complex domestic and international situation and improve the efficiency of international development of service industry. In order to ensure Japan's leading position in global economic and social competition, the Japanese government has formulated supporting policies including rural logistics, promoting the development of logistics industry, increasing infrastructure investment, optimizing network infrastructure and improving management and

maintenance level. In addition, the wholesale market is Japan's agricultural product distribution center, which has strict requirements for the relevant facilities of the wholesale market. Each agricultural product wholesale and distribution center must establish storage facilities in accordance with the laws of Japan's wholesale market, with fully functional cold storage facilities, loading and unloading facilities and distribution facilities. At the same time, because these agricultural product wholesale and distribution centers are usually set up with Japanese social groups such as enterprises Agricultural associations, with abundant funds and good credit, have attracted a large number of rural logistics distribution.

In Japan, the retail and wholesale industries are basically equipped with automatic information platforms at the same time, covering major trading countries. Both sides can conduct online transactions through the Internet, reduce a large number of ordering procedures and improve the circulation efficiency of agricultural and sideline products. At the same time, agricultural producers can use the system logistics information platform, enterprises can effectively allocate resources through the information platform, and consumers can buy fresh products and enjoy delicious food at home.

Intermediary platform is one of the main characteristics of rural logistics services in Japan. The circulation of agricultural and sideline products in Japan is usually carried out directly between producers and consumers. However, due to its strong strength, good reputation and perfect sales channels, the intermediary platform has been trusted by the majority of farmers.

4.2.2 Rural logistics in the United States

The rural logistics and distribution infrastructure in the United States is perfect, with a national highway network and the world's first aviation hub, which can ensure the rapid transportation of fresh agricultural products. Moreover, many large-scale agricultural products acquisition and processing enterprises have railways nearby, which can be used to transport a large number of goods.

The logistics information platform built in rural areas of the United States started earlier and has perfect functions. The United States has established various agricultural products trading and distribution websites. According to the data, more than 90% of rural residents buy and sell agricultural and sideline products online and buy household necessities. At the same time, relevant departments in the United States have established the logistics and distribution management system of agricultural products through this system, which can guide farmers to plant and sell agricultural products and better understand the logistics status of their products.

The agricultural third-party logistics in the United States is relatively developed, which can provide professional services for farmers. According to the actual situation of agricultural products production, various industry associations can request the government to increase support for agricultural products, or provide infrastructure construction for agricultural products logistics. This has become a bridge between the government and farmers, enabling the government to better allocate rural public resources and promote rural economic development. Due to the influence of administrative ideas, the federal government and the U.S. government generally do not directly intervene in the development of rural logistics distribution industry, but through economic macro-control, give play to the role of the market in the rational allocation of resources, formulate relevant laws and regulations, regulate and control economic policies, and ensure the relative stability of agricultural production and circulation. In order to maintain the overall balance of market supply and demand, it is worth noting that the agricultural futures market in the United States and the social platforms of many logistics enterprises are constantly active in relevant markets, effectively promoting and improving the development of rural logistics distribution.

5 Path implementation analysis

5.1 Analysis of the advantages of local villagers' participation in crowd sourcing

5.1.1 Crowd sourcing logistics has its own advantages.

First, it can make full use of social idle resources and improve distribution efficiency. Logistics enterprises adopt crowd sourcing logistics mode, which can make full use of idle social resources, digest transportation pressure and improve distribution efficiency, especially seasonal express. The advantages of crowd sourcing transportation mode are more prominent. When the number of express delivery is large, enterprises can effectively carry out express delivery business without increasing official express service.

Secondly, use modern information technology to effectively plan the distribution path of logistics information platform and shorten the distribution time. Customers can also track express delivery information through crowd sourcing platform.

Finally, using this form can reduce the inventory and the number of workers and reduce the cost. On the one hand, logistics enterprises can transfer storage to vehicles in transportation; On the other hand, many idle social labor will voluntarily join the crowd sourcing logistics

distribution platform, and the platform does not have to pay too high a fee.

5.1.2 Trust advantage in acquaintance society

Although urban crowd sourcing logistics platform can reduce logistics costs and improve distribution efficiency to a certain extent, there are also many problems caused by customers' distrust of strangers. However, in the environment of rural acquaintance society, due to the relative trust of customers in the carrier, it not only solves the problem of urban crowd sourcing distribution, but also improves the efficiency of rural logistics distribution.

First of all, most villagers in rural areas have close geographical and interpersonal relationships. Affected by traditional culture, they can effectively reduce credit risk. Secondly, the face-to-face communication of rural residents is one of the most common social activities, so most villagers are very familiar with other residents, which can effectively solve the problem of difficult to find customer addresses. Finally, with the increase of rural residents' income, their consumption level is also gradually improved, and the demand for online shopping is also greatly increased. In addition, at present, most rural residents have electric vehicles, tricycles and other means of transport, and have the ability and possibility to participate in crowd sourcing logistics distribution.

5.2 Specific implementation opinions

At present, rural logistics mainly includes Alibaba's rural community logistics model, JD's self operated logistics distribution model, SF's cooperation model with rural stores, etc., but they all have their own shortcomings, so they need innovation and improvement. Crowd sourcing City crowd sourcing has already formed crowd sourcing in the urban logistics distribution. But in the rural area, it is still in the exploratory stage under the background of "Internet plus". We must innovate the existing crowd sourcing logistics mode and establish a crowd sourcing distribution mode that is consistent with the actual situation in rural areas.

5.2.1 Accelerate the construction of new infrastructure, promote high-quality development

Improve the construction of rural logistics network, and consolidate the new infrastructure required by crowd sourcing logistics. The construction of new infrastructure is mainly led by the state and industry. It usually emphasizes overall planning, unified standards and norms, and interconnection. The UK is promoting the construction of the National Digital twin, hoping to achieve interoperability through sharing data, standards and frameworks in the early development stage of the digital twin, rather than considering interoperability after the separate development of system modules. The EU has been promoting the construction of

unified block chain service infrastructure since 2018, which will be deployed in the first quarter of 2020, and launched the first node of European block chain service infrastructure in Belgium in February 2020. At present, accelerating the construction of new infrastructure is an important measure to build a new pattern of "double cycle" development. It is very important to promote the high-quality development of rural crowd sourcing logistics and attract effective investment.

5.2.2 Simplify registration procedures and attract local idle resources.

Crowd sourcing is easier to implement in the current model. The information of rural crowd sourcing logistics can be realized by registering on the platform. In rural areas, some staff who are familiar with local customs and geographical location can be recruited according to local conditions. Generally speaking, local rural residents are familiar with the environment, can bear hardships, have a higher sense of security, can also win the trust of residents, and have a higher sense of security than foreign residents. In rural areas, there are idle transportation capacity of commuters, workers and drivers between villages. These manpower can be fully utilized by building a crowd sourcing platform. When registering, the first step is to verify the ID card, social security card and other documents, and conduct preliminary screening. The second step is to carry out relevant training, and the training needs to be evaluated. The third step is to protect high-value goods. If the value of goods exceeds the specified value, bank cards must be bound to get orders to enhance security. The fourth step is to establish a credit rating system, which pushes the information hierarchically according to the different credit ratings of shippers in crowd sourcing mode.

5.2.3 Innovate the rural crowd sourcing mode and enhance the ability to serve the people's livelihood.

The rural crowd sourcing mode can not completely imitate the urban crowd sourcing logistics. It is necessary to establish a new mode, break the city's fixed mode of "door-to-door delivery and single billing", and choose the customer demand as the distribution target and the distribution distance as the main billing item. With the help of crowd sourcing logistics platform, after receiving the package receiving notice, consumers publish it on the platform in the form of task. The carrier shall be responsible for transporting the goods to the place designated by the buyer and completing the distribution work. There are three paths:

Township level station -- village store mode.

Township level stations are generally far away from consumers' residences, which is difficult to meet their distribution needs, while village stores are generally close. Setting up stations in village stores can reduce the burden of farmers to a certain extent, and they can pick up parts independently in village stores near their residences.

Township level site -- village store -- portal mode.

Set up a door-to-door distribution mode, and farmers can enjoy the service of distribution to the door.

Village store portal mode, farmers can still enjoy the service of delivery to the door.

All three routes use crowd sourcing to deliver the express to the portal or village store. Distributors can get different rewards according to the length of the path. The first mock exam has broken the restrictions on the original goods reaching the town, expanded the coverage of rural logistics, and made full use of the idle human resources in rural areas, thus improving the efficiency of distribution.

In rural areas, crowd sourcing logistics will become a part-time model, and everyone can become a courier. Using this model in rural areas, on the one hand, can alleviate the distribution difficulties in rural areas; On the other hand, it can bring income and improve farmers' living standards.

6 Conclusion

Rural Revitalization is an important systematic project. After revitalization, the countryside should present the distinctive characteristics of overall beauty, global beauty and folk custom beauty. With the continuous expansion of the scale of e-commerce in China, the express demand of farmers puts forward higher requirements for rural logistics. The current situation of rural logistics distribution has some problems, such as high cost and slow speed. The distribution can not realize door-to-door delivery, which affects the online shopping experience of farmers. Rural logistics has the characteristics of dispersion, imbalance, difference and complexity. Therefore, it is difficult to adopt a unified model to promote the development of rural logistics in some areas. In the specific analysis process, we need to comprehensively consider the economic level, industrial structure, urban and rural development, logistics foundation and other factors. On the basis of effectively utilizing the stock resources of postal, transportation and other departments, strengthen win-win

cooperation and resource cooperation, fully mobilize the market mechanism, promote the rural logistics resource sharing mode according to local conditions, realize resource sharing and promote the development of rural logistics.

In rural areas, the use of crowd sourcing model can not only reduce the cost of logistics enterprises and solve credit risks, but also generate income for farmers. Rural crowd sourcing logistics model can make full use of idle labor and resources, help to solve the end problem of rural logistics distribution, integrate human and material resources, and generate income for farmers in action, but we should also pay attention to prevent the risks. Therefore, to establish a logistics crowd sourcing platform in rural areas, we should clarify the responsibilities of relevant parties, implement real name certification, prevent forgery, establish corresponding credit evaluation mechanism and provide necessary logistics training. At the same time, the state should gradually establish a perfect rural education system. Improve the legal system in the field of crowd sourcing logistics, so as to better serve rural distribution and bring greater benefits to rural economic life.

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