

Research on the Development Status and Strategies of Rural E-Commerce Under the Background of Rural Revitalization Strategy——Based on Field Research and Empirical Study of Three Cities in China

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Abstract. Rural e-commerce is a high-speed engine to implement the rural revitalization strategy and accelerate rural modernization. To develop rural e-commerce, we should adapt measures to local conditions and take the road of e-commerce suitable for ourselves. This paper studies the supply side and demand side of rural e-commerce, and at the supply side level of rural e-commerce, based on the field investigation, this paper uses the SWOT analytic method to study the current situation of e-commerce in rural areas of Weihai, Yantai, Rizhao. Then using the questionnaire analysis method, from the perspective of farmers, views of agricultural producers on rural development e-commerce poverty alleviation were studied. At the demand side level of rural e-commerce, this paper uses the OLS regression model to study the factors affecting consumers' willingness to purchase agricultural products through self-built function model. Then, it analyzes the development prospects of rural e-commerce from the perspective of consumers through the distribution of questionnaires. Finally, based on the previous analysis, this paper puts forward research conclusions and suggestions from the supply side of rural e-commerce, the demand side of rural e-commerce, and Chinese government's macro-control policy.

Keywords: rural revitalization, rural e-commerce, field research, empirical analysis.

1. Introduction

Agriculture, rural areas, and peasant issues have always been fundamental issues relating to the national economy and people's livelihood. The 19th National Congress of the Communist Party of China put forward the rural revitalization strategy to accelerate the solution of rural issues. Rural e-commerce is an important means to implement the strategy of rural revitalization, and the monitoring of business big data shows that in 2018, China's rural online retail sales reached 1.37 trillion yuan, an increase of 30.4% year-on-year; the retail sales of the national agricultural product network reached 230.5 billion yuan, an increase of 33.8% year-on-year. In this context, the development of rural e-commerce and the active promotion of the transformation of the traditional sales model of agricultural products are of great significance for promoting the comprehensive upgrading of agriculture, accelerating the development of rural modernization, and improving the quality of life of farmers.

At this stage, China's rural e-commerce has a broad space for development, but subject to the short history of its own development, the perfect rural e-commerce ecological environment has not yet been built, the aging of the rural labor population, the weakness of the e-commerce foundation and the lack of e-commerce talents are all factors restricting the development of rural e-commerce. The operation of rural e-commerce will open the door to modernization for agricultural development: drive the optimization and upgrading of the rural industrial structure, optimize its production scale and sales methods on the basis of increasing production, achieve a comprehensive increase in output and sales, and promote agricultural supply-side reform. The development of rural e-commerce and the enhancement of rural infrastructure construction can provide new growth points for rural economic development, which is conducive to maintaining the synergy between rural and urban areas, promoting the combination of urban and rural areas, and creating a new socialist modern countryside; The development of rural e-commerce can provide farmers with more accurate market information,

reduce the risk of blind production, and help change farmers' inherent production concepts, open up sales paths, increase farmers' income, and fundamentally improve farmers' living standards. Due to the uneven level of e-commerce development in different rural areas, it is necessary to solve the problems of rural e-commerce according to local conditions, find a suitable e-commerce development model, and lead the development of e-commerce in various regions.

2. Literature Review

Under the guidance of the rural revitalization strategy, the development of rural e-commerce is becoming more and more rapid. But due to the different objective conditions in rural areas, the e-commerce sales models of different agricultural products are not the same. At present, the main research focuses on the analysis of various rural e-commerce business models, according to the team's survey in various rural areas, this paper selects O2O, B2B2C and agricultural product sales models based on online media for detailed literature review research.

2.1 Sales of fresh fruit and vegetable based on O2O model

O2O (Online to Offline) is the integration of online virtual economy and offline physical stores. The core of O2O is to bring online consumers to physical stores, where consumers screen offline goods and services online, and finally enjoy services and experience products independently offline through online payment and settlement. Since it is a physical store consumption, the O2O model has obvious regional service characteristics [1]. Lin Bo and Sun Xiaomei (2015) believe that the O2O model is a must for online sales of fresh fruits and vegetables, because although fresh fruits and vegetables have huge sales potential in the agricultural product market, due to their own difficulty in keeping fresh and the high logistics costs in the transportation process, the penetration rate of fresh e-commerce is less than 1%. While the O2O sales model is that consumers consume in physical stores, which solves the problem that fresh fruits and vegetables are difficult to keep fresh in transportation and high logistics costs [2]. In the process of practice, on the one hand, it is necessary to give full play to the characteristics of offline physical store product real-time experience and provide high-quality after-sales service to help online stores promote user duplication, on the other hand, to apply the advantages of customer data analysis in online sales to help physical stores achieve targeted personalized services and improve user adhesion.

2.2 Sales of agricultural products based on B2B2C model

B2B2C (Business to Business to Customer) is an innovative e-commerce model. The first B refers to the seller in a broad sense (either a company or an individual). The second B refers to the trading platform, that is the platform connecting buyers and sellers. Not only provide transaction services, but also provide related additional services. C refers to the buyer, that is the consumer. In the B2B2C e-commerce model, farmers and agricultural product suppliers are only responsible for the production of products, consumers only need to choose on the e-commerce platform to pay for consumption, and other links in the middle are handled by B2B2C service providers, that is, the integration and integration of agricultural product information, product promotion, quality management, logistics, payment and consumer data [3]. The outstanding feature of this e-commerce platform-based sales model is that it provides great convenience for farmers and consumers, whether it is an individual or a company can directly contact the e-commerce platform, which reduces the threshold for farmers to use e-commerce, and can help rural areas with weak e-commerce foundation to develop e-commerce rapidly in the short term.

2.3 Agricultural products e-commerce sales model based on network media

With the continuous popularization of the Internet, WeChat circle of friends and other online media have expanded the scope of people's social networking, facilitating mutual communication with each other. If farmers can use online social media for agricultural product publicity, it is undoubtedly a

way to effectively develop rural e-commerce. Although Lin Bo and Sun Xiaomei (2015) believe that social media such as WeChat platforms can only be an auxiliary e-commerce model, they ignore the simplicity of using online social media to develop e-commerce [4]. For some farmers who lack a professional e-commerce foundation, they use online social media to promote agricultural products in a short period of time, which is simple to get started and has strong operability. Farmers communicate with consumers in a timely manner through social media, understand their needs, establish trust relationships for sticky marketing, and fully integrate information on social media to gradually expand their customer base and increase sales.

In summary, the current research mainly focuses on the comprehensive analysis of a certain rural e-commerce poverty alleviation model, and some scholars only analyze from the consumer level or producer level. However, there are relatively few studies on the supply side and demand side of rural e-commerce. In view of this, this paper selects three typical cities from Shandong, a large agricultural province, to study the supply side and demand side of e-commerce poverty alleviation at the same time. On the supply side, this paper adopts the method of field research, and on the demand side, the method of quantitative empirical analysis is carried out by using the self-built function model, hoping to contribute to the revitalization of Rural Areas in China.

3. Research Design

3.1 Research object

(1) Consumers: The team conducted a questionnaire survey on the understanding of rural e-commerce and the purchase of agricultural products among consumers.

(2) Producers of agricultural products: a. Huancui District, Weihai City: Villagers from Likoushan Scenic Area, Beicao village, Beishang village and other places, as well as the general manager and related people of Yate Green Food Co., Ltd. b. Muping District, Yantai City: Guijiazhuang Village, Xiaozhai Village, General manager of Hanlan Agricultural Technology Co., Ltd. and related people. c. Wulian County, Rizhao City: Villagers in Liujiaping Village and surrounding villages.

3.2 Research target

(1) Investigate the current situation of rural e-commerce development in some parts of Shandong Province. Rural e-commerce is a new type of development platform, but subject to the rural conditions and natural environment and other objective factors, different rural areas whether to establish e-commerce and the development of e-commerce are not the same. The team went to Weihai City Yangting Town, Likoushan, Yantai Muping District and Rizhao Wulian County villages to investigate and study, through visiting village committees, companies and cooperatives and interviewing villagers to collect a series of problems encountered in rural e-commerce development.

(2) Analyze the pros and cons of existing e-commerce models. The current rural e-commerce takes B2C model (Business to Consumer model), C2B model (Consumer Customization model), F2C model (Farm Direct Supply model), B2B model (Business to Business model) and agricultural community O2O model (Online and Offline Combination model) as the main development model, which have a great role in promoting the sales of agricultural products. But there are also some problems, the team from the perspective of consumers and producers studied the advantages and disadvantages of the e-commerce model.

(3) Look for new measures for the development of e-commerce. Based on the data collected by each village, the team studied the sales methods and logistics data of agricultural products, analyzed the bottlenecks in the development of e-commerce in various regions, combined with the feedback data of consumers, combined the theoretical knowledge of e-commerce with the actual situation of rural areas, and found appropriate measures for the development of e-commerce.

3.3 Research method

(1) Fieldwork investigation method. Field investigation is recognized as the basic methodology of anthropology, that is, the practice and application of "direct observation method", and it is also the pre-step for obtaining first-hand raw materials before the research is carried out. The team went to villages in Yangting Town, Likoushan, Muping District of Yantai and Wulian County of Rizhao to conduct field research. By visiting village committees, companies, cooperatives and interviewing villagers, the development information of rural e-commerce in various regions was collected.

(2) Questionnaire survey method. From the perspective of consumers and producers, the comprehensive inquiry of data to investigate the public's views on rural e-commerce. On the one hand, understand farmers' views on the development of e-commerce in the process of agricultural product sales, on the other hand, understand the needs and attitudes of consumers to purchase agricultural products through e-commerce platforms.

(3) Literature research method. This paper combines the existing theory with the actual survey results, makes full use of the library to consult books, newspapers, papers and academic reports and other relevant materials, understands the relevant policies for the development of agricultural product e-commerce platforms in China, analyzes and studies the relevant models of agricultural product e-commerce, improves and innovates on the existing basis.

(4) Model analysis method. On the basis of interview surveys and questionnaire surveys, with the help of software tools such as SPSS, MATLAB, EXCEL, etc., histograms and scatter charts are drawn for correlation analysis and regression analysis, and Eviews is used to analyze the survey results of questionnaires for data analysis. This paper builds the OLS model to study the factors affecting consumers' willingness to purchase agricultural products and uses the SWOT analysis method to enumerate the main internal advantages and disadvantages as well as external opportunities and threats of rural e-commerce in Weihai, Yantai and Rizhao, and then conducts a systematic and comprehensive analysis. Finally, accurate information valuable for the research on the development status and prospect of the agricultural product e-commerce platform is extracted, and conclusions are drawn through continuous comparison, analysis and summary to ensure the objectivity and accuracy of the final conclusion.

(5) Comparative analysis method. In order to have a more thorough understanding of the shortcomings of the e-commerce platform in selling agricultural products, this paper compares and analyzes the advantages and disadvantages of the online and offline sales models of agricultural products and the sales channels of different e-commerce agricultural products, compares the views of consumers and producers on e-commerce platforms, and compares the development models of e-commerce in Weihai, Yantai and Rizhao horizontally. This paper comprehensively analyzes the aspects that need to be improved when selling agricultural products on e-commerce platforms, and puts forward practical improvement methods.

(6) Theoretical analysis method. This paper compares the relationship among producers, e-commerce platforms and consumers, combines the current situation and prospect of e-commerce industry, and uses economic theory to analyze the balanced relationship among them, so as to promote a virtuous cycle and grasp the right development direction.

4. Supply Side Analysis of Rural E-commerce

4.1 SWOT analysis based on field research

Field investigation is recognized as the basic methodology of anthropology, that is, the practice and application of "Direct Observation Method", and it is also the pre-step for obtaining first-hand raw materials before the research is carried out. The team carried out field research in Weihai, Yantai and Rizhao of Shandong Province respectively, and obtained relatively real local information through interviews and questionnaires. In the following, SWOT analysis is used to make a matrix analysis of

the current situation of rural e-commerce in Weihai, Yantai and Rizhao from four aspects: strengths, weaknesses, opportunities and threats.

Weihai SWOT analysis. In Huanchi District of Weihai City, the team focused on the sales of fresh fruits and vegetables. The team found that there were many cherries picking parks in Likoushan and Beicao village. Local farmers could not only attract consumers to shop cherries in the garden, but also carry out online publicity and sales of cherries through wechat circle of friends. This combination of online and offline is very similar to the O2O e-commerce model, but different from it, local residents can directly sell online and deliver them to consumers through express delivery services such as SF Express, JD.com and EMS, instead of requiring consumers to go offline to pick up cherries from the picking garden. However, fresh fruits like cherries are difficult to keep for long periods of time and have to go through many steps on the way to be shipped, which raises transportation costs, so many orchard owners have complained about delivery costs. The main fruit production in the Beicao village is apricot. While because apricots are hard to keep, it's hard to sell them by picking them, so all the apricots in the Beicao village were firstly concentrated in the village, established a cooperative for large-scale planting and concentrated production of large quantities of apricots. Then, as a wholesaler, the apricots were transported to the wet market and some large enterprises. Yate Green Food Co., Ltd., as a green vegetable production company, in close cooperation with universities, takes on many national issues, researches and develops production of high-quality vegetables, forms its own brand. However, the current vegetable sales of the company are still limited to the subjective judgment of the company's manager Xu Tao. The company has insufficient grasp of the relevant information about the market demand and hardly takes the road of online sales. It only has supply relationship with Weihai leading supermarket Jiajiayue, etc., which hinders the expansion of sales of Yate Green Food Co., Ltd. to a certain extent.

Table 1. SWOT analysis in Wei Hai

| place | Weihai | | |
|---------------|--|--|---|
| | Yate Green Food Co., Ltd. | Likoushan and Beishang Village | Beicao Village |
| Strengths | (1) Undertake two national projects and develop vegetable planting technology; (2) good quality vegetables, the annual output of tens of thousands of kilo; (3) Create a green brand and establish exclusive supply relationship with Jiajiayue. | (1) Fruit enjoys a local reputation and is competitive; (2) offline picking gardens, good consumption experience, strong after-sales service; (3) Expanding sales channels through online promotion. | (1) Apricots are a local specialty (2) The land in the village is concentrated, enabling large-scale production |
| Weaknesses | (1) The company is small and the ability to obtain market information is insufficient; (2) Sales need to increase as the company hardly uses online sales. (3) Weak storage conditions and high transportation costs. | (1) Sales have not formed a scale, online sales and offline sales are relatively independent; (2) Online customers are relatively dispersed, and it is not easy to expand the scope of sales; (3) Fresh fruits and vegetables are difficult to keep fresh, storage cost, transportation cost is high. | (1) Apricot can not be kept for a long time, easy to damage in the process of transportation, limited range of sales; (2) Serious aging population, lack of e-commerce development experience. |
| Opportunities | (1) Develop online sales through the Internet to attract more consumers and increase sales (2) Develop high and new planting technology, enhance the quality of agricultural products, improve the core competitiveness | (1) The offline picking garden is used to display agricultural products, while online trading drives the offline sales speed, forming an O2O model; (2) Promote online publicity, attract consumers to pick in the garden, so as to reduce the loss of fruits and vegetables in the transportation process; | (1) Centralized production is conducive to further expand the scale of production, complete system (2) Develop tourism and attract tourists to buy apricots and other agricultural products |

| | | | |
|---------------------------|--|---|--|
| Threats | (1) The company's agricultural product marketing subject is not mature, can not effectively solve the contradiction between small production and large market. (2) The company's agricultural products are affected by seasonal changes | (1) The scale of individual production is small and it is at a disadvantage in the market competition. (2) The logistics cost of fresh fruits is high, and the farmers have to bear high express costs, and the product price is low in competitiveness. | (1) Apricot transport cost is high, logistics expenses are much (2) Lack of relevant e-commerce technical support, difficult to introduce talents; (3) Agricultural products lack brand, low market visibility |
| Existing e-commerce model | E-commerce sales based on online social media | E-commerce sales based on online social media | not available |
| e-commerce platform | WeChat Moments | WeChat Moments | not available |
| physical distribution | expressage | expressage | wholesale |

Yantai SWOT analysis. At present, the development of e-commerce in Muping area has taken off. The local Rural Agriculture Bureau often organizes farmers to participate in the "Rural Marketing" e-commerce training, but the villagers' understanding of e-commerce is still in the preliminary stage, and they have not directly operated the e-commerce platform.

In Xiaozhai Village, local villagers cooperate with Korea Yantai Hanlan Agricultural Technology Co., LTD, and with the support of foreign technology, villagers farm mainly on blueberries. However, there is a serious loss of young labor force in Xiaozhai Village. Most of the middle-aged and elderly people in the village are over 40 or 50 years old. In addition, there is no core technology or basic knowledge of e-commerce, so the villagers' current agricultural development is more passive.

Table 2. SWOT analysis in Yantai

| place | Yantai | |
|---------------|--|--|
| | Xiaozhai Village | Guijiazhuang Village |
| Strengths | (1) Working with Hanlan Technology Co., Ltd. to provide jobs for villagers (2) Introduce new technology from Hanlan Company to produce high quality blueberries and make blueberry sauce in the processing plant | (1) A number of professional cooperatives have been set up to produce apples on a large scale, with an annual output of 10,000 kilo (2) Apple has passed the green certification, quality assurance |
| Weaknesses | (1) The Labour force is so small that blueberry farming cannot attract many young people to work; (2) Short industrial chain, only fresh blueberry trading and blueberry sauce processing; (3) It doesn't have its own brand of blueberries to sell | (1) Cooperative establishment time is short, management experience is insufficient, lack of processing plant (2) Cooperatives have not registered trademarks, products lack competitiveness (3) Lack of knowledge of e-commerce makes it difficult for villagers to find a starting point. |
| Opportunities | (1) Promote Hanlan Company to cooperate with township enterprises, increase technical positions, recruit e-commerce technical talents, and attract young talents to return to rural areas (2) Strive to build green and organic brands and increase market competitiveness (3) Further cooperation with e-commerce platforms with the support of local governments | (1) Large-scale production provides output guarantee for sales (2) Further build green organic apple brand, improve visibility and market competitiveness (3) Good connections with e-commerce platforms, so as to achieve high production to high sales |
| Threats | (1) Blueberries are not well known and are not competitive on e-commerce platforms (2) Hanlan company belongs to the foreign enterprise, the scale is not large, the ability to obtain and deal with the local market information is relatively weak | (1) Agricultural trademarks are not complete, lack of competitiveness in the market, the same industry competition is fierce; (2) Lack of technical support (3) The initial investment cost of running stores on Taobao, Jingdong and other e- |

| | | |
|---------------------------|------------------------------------|---------------------------------|
| | | commerce platforms is too large |
| Existing e-commerce model | B2B2C | not available |
| e-commerce platform | Enterprise, Taobao, WeChat Moments | not available |
| physical distribution | expressage | not available |

Rizhao SWOT Analysis. Liujiaping Village in Wulian County has a rugged geographical location and poor transportation facilities that hinder the development of the local countryside.

Liujiaping village teems with tea and tea fields spread all over the mountains. Different from the above-mentioned Weihai and Yantai areas, local farmers have the experience of opening Taobao shops online to sell tea, which largely expands the scope of Liu Jiaping village tea sales. However, on Taobao, the tea of Liujiaping village needs to compete with the big domestic brands such as Jinggangshan Tea and Biluochun tea. But the tea varieties in Liujiaping Village are single and the brand power is insufficient, so the phenomenon of "big brands rejecting small brands" appears. Consumers' recognition of Wulian tea is relatively low, which can lead to a backlog of tea products, reduce profits and even create a vicious circle. It can be seen that even if farmers can use e-commerce platforms for sales, they should also consider how to enhance the quality of their own agricultural products, so as to improve their popularity and product competitiveness.

Table 3. SWOT Analysis in Rizhao

| place | Rizhao |
|---------------------------|--|
| | Liujiaping Village |
| Strengths | (1) Tea planting area is wide, set up a professional tea processing poverty alleviation workshop, quality assurance; (2) We have set up shop on Taobao.com and preliminary e-commerce operation |
| Weaknesses | (1) Single tea varieties, low brand awareness (2) Liujiaping Village has a rugged geographical location, inconvenient transportation, lack of e-commerce technology, young talent loss (3) There is a lack of coordination among farmers and they operate independently, so the operation scale of e-commerce is small |
| Opportunities | (1) Under the government's targeted poverty alleviation policy, we will promote the basic construction of e-commerce such as Internet and road transportation. (2) Mobilize the linkage between tea producers, processors and consumers |
| Threats | (1) Online sales and such famous tea Longjing, Tie Guanyin exists fierce competition (2) The inconvenience of transportation brings high express transportation (3) It is difficult for individual farmers to cope with the ever-changing market information |
| Existing e-commerce model | B2C、C2C |
| e-commerce platform | Taobao |
| physical distribution | expressage |

4.2 Questionnaire feedback analysis of farmers

In order to have a deeper understanding of rural farmers' cognition of poverty alleviation through e-commerce, this paper distributed questionnaires to farmers located on the supply side of rural e-commerce while conducting field research.

The main purpose of the questionnaire survey is to understand farmers' views on the development of e-commerce in the process of selling agricultural products, and then put forward development opinions from the supply side of rural e-commerce. By analyzing the questionnaire, this paper draws the following conclusions.

The rural population is aging. As shown in Fig. 1, most of the respondents are aged 45 and above, while the proportion of young and middle-aged people is relatively low. At present, there is a lack of fresh blood in rural areas, the serious loss of young labor force, and the limitation of aging population in rural areas, which will lead to the obvious control of the entry of many new things in e-commerce. This is the result of the comprehensive effect of multiple factors, such as the level of knowledge and culture of the group, the degree of concept transformation, and the old industrial model.

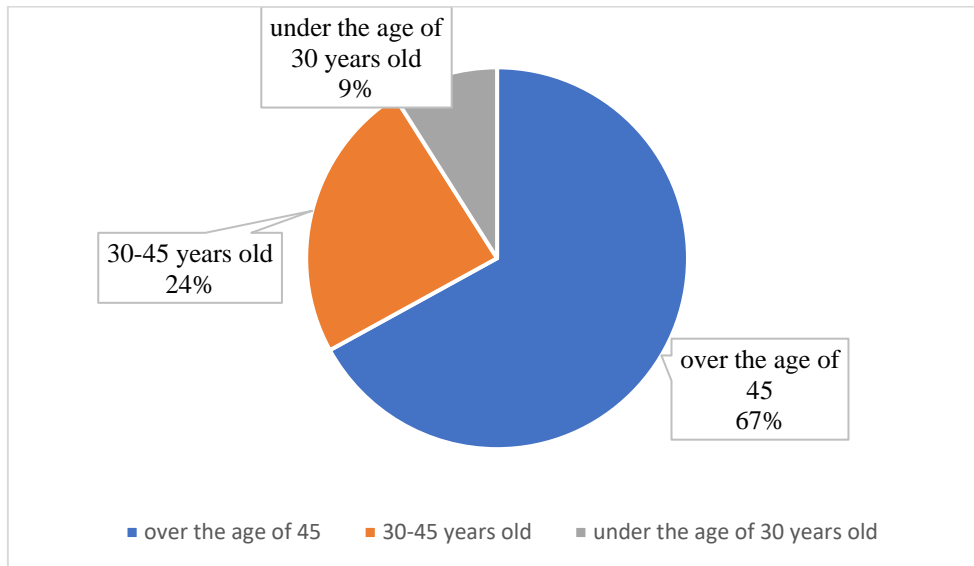


Figure 1. Age composition of rural population

Farmers use the Internet inefficiently. In Fig. 2, we can see that half of the respondents only use the Internet for simple social communication, and some of them can use social media to sell agricultural products, while many of them do not have much contact with online shopping, so there are fewer farmers who set up shop online to sell agricultural products. At the same time, 12% of the respondents almost do not access the Internet. Due to the relatively backward network information construction in rural areas and the majority of the elderly population who have not been exposed to the Internet, it is reasonable that they have a low utilization rate of the Internet. At present, the popularity of the Internet in most rural areas is not high, and farmers' network concept is poor. Most farmers do not use the Internet for marketing, which hinders the online sales of agricultural products.

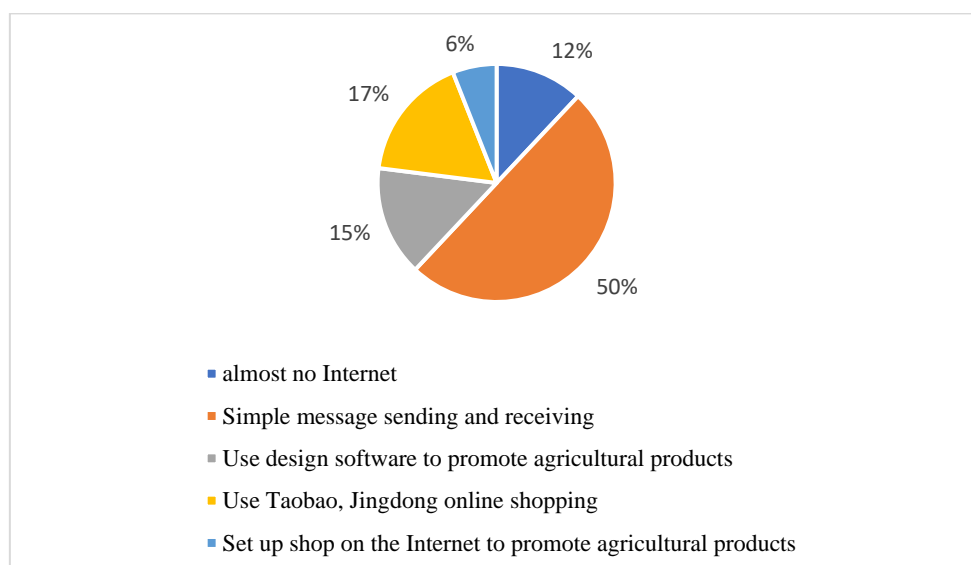


Figure 2. Situation of surfing the Internet

Costs and risks should be considered while developing e-commerce to increase sales. As can be seen from Fig. 3, most respondents hold a positive attitude towards the development of e-commerce to increase sales, but the costs and risks of developing e-commerce are also worth considering. A small number of respondents do not understand e-commerce and are not willing to try it because of their conservative ideas. But the reality is that e-commerce can actually improve agricultural sales. However, at the present stage, the development of rural e-commerce is not mature. The cost and risk should be well regulated while the development of e-commerce increases the sales volume.

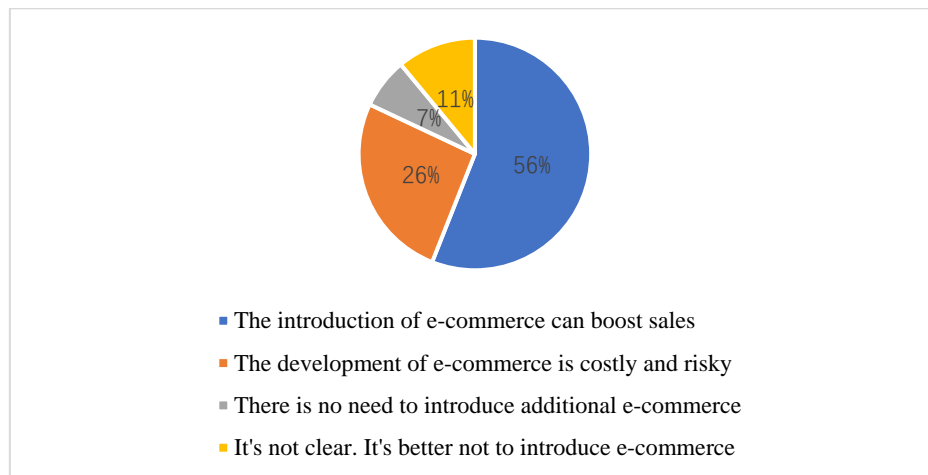


Figure 3. Consider whether the introduction of e-commerce can improve the operation effect

The development of e-commerce is inseparable from the support of talent and technology. According to Figure 4, it can be clearly felt that the respondents generally believe that there are three factors hindering the development of rural e-commerce, which are: the lack of young people in the village, the lack of e-commerce technology and talent support, and the lack of e-commerce knowledge and experience. How to introduce talents and provide technical knowledge for the development of e-commerce in rural areas is a pressing matter of the moment.

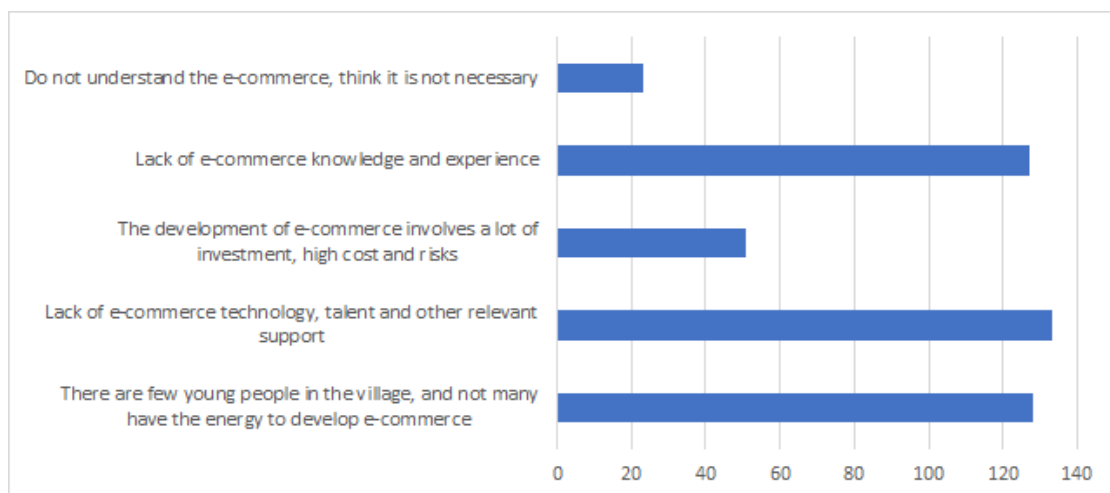


Figure 4. Consider the reasons that hinder the development of rural e-commerce

5. Demand Side Analysis of Rural E-commerce

5.1 Empirical analysis based on self-built model

Research hypothesis. Hypothesis 1: Consumers' own factors are the main factors affecting consumption intention. This paper attempts to explore the influencing factors of consumers'

consumption intention from the perspective of consumers themselves, including their own age, gender, and their support for rural e-commerce poverty alleviation. Therefore, it is assumed that consumers' own factors are the main factors affecting their consumption intention. Hypothesis 2: Consumer purchase intention is not affected by external factors. External factors also tend to affect consumers' purchase intention. External factors such as government macro-control and natural disasters are often listed as factors affecting consumers' purchase intention. For example, policies such as individual income tax reform and consumption subsidies often indirectly affect residents' income and consumption, while natural disasters affect residents' consumption by affecting the quality of agricultural products. Since this paper intends to explore consumers' own factors that affect their consumption intention, it is assumed that consumers' purchase intention is not affected by external factors.

Data sources. In order to obtain first-hand authentic data on the development of rural e-commerce, the author of this paper has visited three cities, namely Weihai, Yantai and Rizhao, carried out in-depth research, explained the relevant knowledge of rural e-commerce, and distributed and collected questionnaires. The questionnaire was conducted both online and offline. Online use of prize question and answer mode; Paper questionnaires were manually distributed and recycled offline. A total of 213 questionnaires were collected in this survey, among which 190 were valid, and the effective questionnaire utilization rate was 89.2%.

Table 4. Variable Selection

| Variables | Variable symbol | Variable name | Definition |
|-----------------------|-----------------|---|--|
| Explained variable | Y | Consumer purchase intention | Consumers' purchase intention of using rural e-commerce platforms to buy agricultural products can be divided into 5 levels according to the intensity of their purchase intention, with 1 indicating strong negative and 5 indicating strong support. |
| | age | Consumer age | The age of the surveyed consumers |
| independent variables | comprehend | Consumers' understanding of rural e-commerce | For consumers' understanding of rural e-commerce, 1 means they have never heard of it, 2 means they have partial understanding, 3 means they have general understanding, 4 means they have basic understanding, and 5 means they know very well |
| | gender | Gender of consumers | The gender of the surveyed consumers is 1 for males and 0 for females |
| | support | The degree of consumer support for rural e-commerce poverty alleviation | Consumers' support for the way of selling agricultural products through e-commerce platforms can be divided into five levels according to the intensity of purchase intention, with 1 indicating strong negative and 5 indicating strong support |

Variable selection. On the choice of the independent variables, through reviewing and combing the domestic and foreign scholars to the problem of rural electricity and consumers' intention based on existing research, found that from the perspective of residents' consumption itself, combining with the availability of data, this article selects the factors may have an impact on consumer spending: consumers' gender, the consumer age, consumers' understanding of the rural electricity. In terms of consumers' support for rural e-commerce poverty alleviation, female consumers may prefer e-commerce shopping compared with male consumers: the older the consumers, the worse their ability to accept new things, and the lower their willingness to consume. The greater the consumers' understanding of rural e-commerce and their support for rural e-commerce poverty alleviation, the greater the consumers' willingness to purchase rural e-commerce may be. In terms of the selection of dependent variable, because consumers' purchase intention is a qualitative variable, this paper assigns a value to consumers' purchase intention and conducts a quantitative analysis. According to the

intensity of purchase intention, it is divided into 5 grades, with 1 indicating strong negative and 5 indicating strong support. The above variables are selected and defined in Table 4.

Descriptive statistics. As can be seen from Table 5, male respondents account for about 46% and female respondents account for about 54% in terms of gender of the questionnaire survey. The proportion of the two is equal, which ensures the balance of sample data and avoids the contingency of the survey results to a certain extent. In terms of age, the respondents in this questionnaire are mainly aged between 18 and 45, accounting for 77%, those under 18 account for 7%, and those aged 45 and above account for 16%. From the perspective of the understanding of rural e-commerce, about 9% of the respondents have a good understanding of the concept of rural e-commerce, about 58% have a basic or general understanding, and about 33% have a partial understanding or have never heard of it. Data show that under the premise of nowadays in the general popularity of e-commerce, the popularization of rural electricity range has also improved, most consumers already have a certain knowledge of electronic commerce and contact, only a small number of don't know much, which laid a solid foundation for the development of e-commerce, but there are still most consumers don't know much of the rural electricity suppliers and contact, It has caused some obstacles to the development of rural e-commerce.

Table 5. Descriptive statistics.

| | AGE | COMPREHEND | GENDER | SUPPORT | Y |
|--------------|----------|------------|----------|----------|----------|
| Mean | 19.86842 | 2.931579 | 0.410526 | 3.984211 | 0.536842 |
| Median | 20.00000 | 3.000000 | 0.000000 | 4.000000 | 1.000000 |
| Maximum | 24.00000 | 5.000000 | 1.000000 | 5.000000 | 1.000000 |
| Minimum | 15.00000 | 1.000000 | 0.000000 | 1.000000 | 0.000000 |
| Std. Dev. | 1.596475 | 1.150363 | 0.493229 | 0.962120 | 0.499958 |
| Sum | 3775.000 | 557.0000 | 78.00000 | 757.0000 | 102.0000 |
| Sum Sq. Dev. | 481.7105 | 250.1105 | 45.97895 | 174.9526 | 47.24211 |
| Observations | 190 | 190 | 190 | 190 | 190 |

Establishment of model. Based on the analysis of the above variables, and referring to the empirical analysis of farmers' willingness to sell agricultural products online by Yang Yan et al., combined with the research needs, this paper establishes a self-designed functional model, in which consumers' purchase willingness is respectively taken as the dependent variable [4]. With consumers' age, gender, understanding of rural e-commerce, and support for poverty alleviation by rural e-commerce as independent variables, the following model is designed:

$$Y = \beta_0 + \beta_1 \text{age} + \beta_2 \text{gender} + \beta_3 \text{comprehend} + \beta_4 \text{support} + \varepsilon \quad (1)$$

Where Y represents the consumer's purchase intention, age represents the consumer's age, gender represents the consumer's gender, gender represents both the consumer's understanding of the rural e-commerce, support consumer's support for the poverty alleviation of the rural e-commerce, and ε represents the error term.

Analysis of Empirical results. This paper makes use of Eviews7.2 and OLS method for regression analysis, and makes use of the data collected by the team to do regression on the above model and get the results in Table 6.

Table 6. Regression results

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|------------|-------------|------------|-------------|--------|
| AGE | 0.024434 | 0.036242 | 0.674180 | 0.5010 |
| COMPREHEND | 0.353641 | 0.052401 | 6.748688 | 0.0000 |
| GENDER | 0.007769 | 0.114001 | 0.068149 | 0.9457 |
| SUPPORT | 0.541707 | 0.061619 | 8.791270 | 0.0000 |
| C | -0.109965 | 0.717479 | -0.153267 | 0.8784 |

As can be seen from Table 6, T statistics of variables AGE and GENDER are small and P value is large, indicating that AGE and GENDER are not significant in this model. The t value of the variables COMPREHEND and SUPPORT is large, and the P value is zero, indicating that both are significant in the model. It can be seen that consumers' understanding of rural e-commerce and their support for the development of rural e-commerce have a great impact on consumers' consumption intention. The more familiar consumers are with the model and process of rural e-commerce, and the more support they have for the policy of rural poverty alleviation through e-commerce, the greater consumers' consumption intention. However, the age and gender of consumers have no effect on consumers' consumption intention, that is, there is no difference in the consumption intention of rural e-commerce between males and females, and between young and old people. Of course, the lack of significant gender and age may be due to the fact that the survey object group is relatively single and unrepresentative, which may lead to the accidental result, which is also the deficiency of this study.

5.2 Consumer questionnaire feedback analysis

The empirical part of this paper mainly explores the factors affecting consumers' willingness from the level of quantitative analysis. The following paper hopes to analyze the factors affecting the development of rural e-commerce and consumers' expectations of rural e-commerce from the perspective of consumers from the level of qualitative analysis. Therefore, collecting empirical analysis questionnaires, this paper conducted another questionnaire survey among rural e-commerce consumers. Through the analysis of the questionnaire, this paper draws the following main conclusions.

A large number of consumers do not fully understand the sales model of rural e-commerce. As can be seen from Figure 5, about 11% of consumers have a good understanding of the concept of rural e-commerce sales model, about 45% have a basic or general understanding, and about 44% have a partial understanding or have never heard of it. It is showed that most consumers don't know much about the sales model of rural electricity, then the use frequency of rural electricity to buy agricultural products is not very high, only rural electricity for consumers to know more about, contact, so consumers through rural electric business platform willingness to buy agricultural products will be enhanced, the development of rural electricity will be effectively supported. This also further confirms the empirical analysis conclusion above.

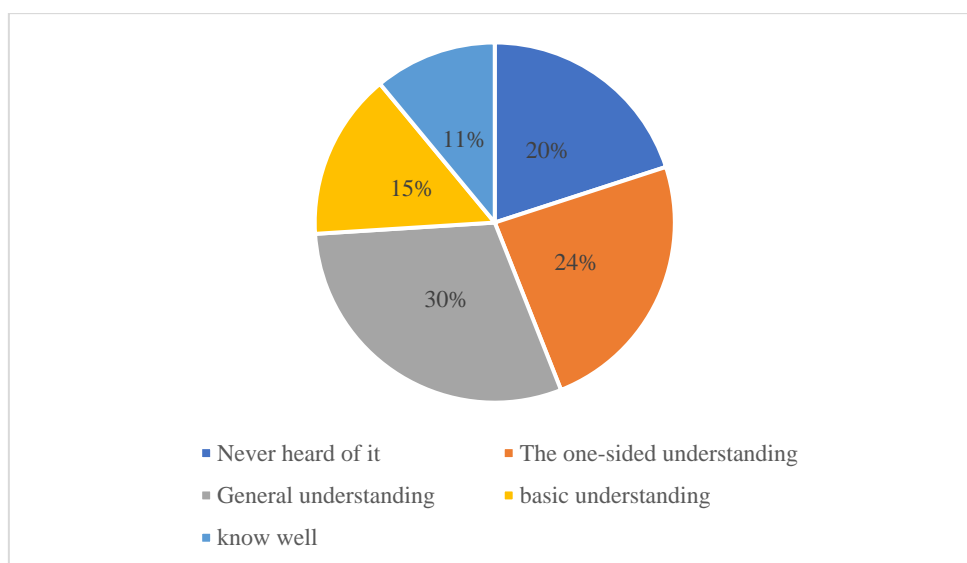


Figure 5. Understanding of rural e-commerce sales model

The quality of agricultural products is the primary concern of consumers. When consumers buy agricultural products online, they often need to consider a variety of factors. As can be seen from Figure 6, the most important factors are commodity quality and product freshness, which indicates

that the awareness of food quality and safety is at the top of consumers' minds. Secondly, the price of products, which is often related to the income level of consumers. Secondly, logistics speed, merchant reputation and after-sales service and other factors, which reflect consumers' satisfaction with merchants from another aspect, determine the long-term purchase intention in the future; Finally, there are other factors such as payment method and place of origin. To sum up, to ensure the freshness and quality of products is still the first priority, and only products with high price can win the favor of consumers.

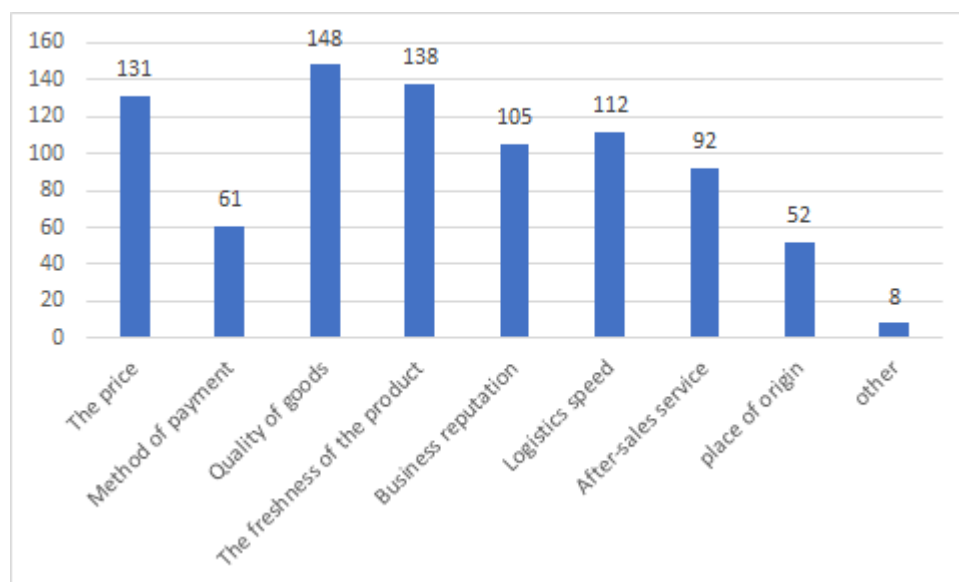


Figure 6. Factors to consider when buying agricultural products on the Internet

Order type personalized production or will become the development trend. The above sales models have their own advantages and disadvantages, and different agricultural products trade differently. Only by finding a sales model that balances the demand side and the supply side according to the actual situation can we find a development path suitable for ourselves and achieve a win-win situation between farmers and consumers. According to the analysis of the chart data, consumers tend to prefer the sales mode with good shopping experience and convenient delivery. C2B/C2F mode can produce and sell according to the needs of consumers and is favored by consumers. Such as B2C/C2C mode due to more consumer contact, so it is also more popular. B2B model is mainly the bulk agricultural products trade between merchants, which has advantages in sales scale. The model with the least choice is the agricultural community O2O model. The main drawback of this model is that consumers need to pick up goods in person. This model facilitates sellers but troubles buyers, thus reducing buyers' consumption experience. It can be seen that personalized production by order has gradually become the mainstream of production and consumption, and may become the development direction of rural e-commerce.

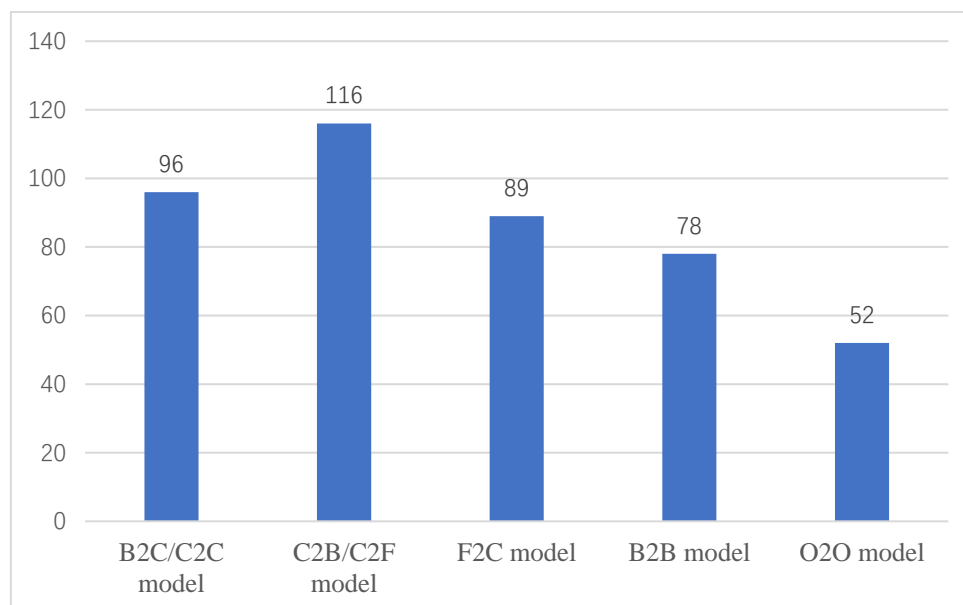


Figure 7. The sales model that consumers prefer

6. Conclusions and Recommendations

6.1 Demand side of rural e-commerce

Help e-commerce poverty alleviation and improve their own cognition. Through empirical analysis, this paper finds that consumers' own understanding of rural e-commerce plays a significant role in consumers' purchase intention, which indicates that whether consumers are willing to support the development of rural e-commerce has an important impact on precision poverty alleviation in rural China. Therefore, consumers themselves should have a love for rural poverty alleviation, care for poor mountainous areas, establish their own awareness of targeted poverty alleviation, and actively understand the relevant knowledge of rural e-commerce. Therefore, the sales volume of rural agricultural products can be increased from the demand side, and then help rural revitalization.

6.2 Supply side of rural E-commerce

Seek development with quality and win the market with brand. Suppliers of rural e-commerce should speed up the brand construction of their own agricultural products. While exploring new sales methods, they should strive to enhance the popularity of local agricultural products and use the brand effect to increase the sales of agricultural products. In the early stage of brand construction, due to the limited funds of farmers and their inability to use expensive advertising marketing, they can promote the formation of the brand by improving the quality of their own agricultural products, attract consumers with high-quality agricultural products, and thus form a word-of-mouth image in the minds of consumers.

Pay attention to industrial linkage and optimize service mode. Rural e-commerce practitioners should actively build a bridge of cooperation. Producers, processors and sellers of agricultural products constitute the basis for the operation and development of the entire industry. Giving full play to the linkage role of agricultural products industry chain will effectively improve the operation efficiency of the market, achieve win-win development, and form a joint force for development. In addition, the collaborative and efficient business service model can also enhance the supply power of rural e-commerce, provide a guarantee for rural e-commerce to provide personalized ordering clothing, and further increase the sales of agricultural products.

6.3 Government macro-control policies

Vigorously promote e-commerce, and the whole people help development. The empirical part of this paper finds that consumers' own extent of understanding of rural e-commerce plays a significant role in consumers' purchase intention and precision poverty alleviation in rural China. Therefore, in order to accelerate the speed of rural revitalization, the government should vigorously advertise the poverty alleviation of rural e-commerce, so that consumers are familiar with rural e-commerce, so as to form a social atmosphere in which the whole people help rural revitalization and poverty alleviation by e-commerce, and thus accelerate the pace of rural revitalization.

Introduce e-commerce according to local conditions and take the road of e-commerce with rural characteristics. Through field research, this paper found that some rural areas in China have the customs of planting specific rural products since ancient times, such as growing tea in Wulian Liujiaping village, and planting apricot fruits in Weihai "apricot village", etc. These areas tend to have natural advantages of some agricultural products, and with a certain scale, therefore, the government can through policy support, actively lead the rural adjust measures to local conditions, develop the specific crops, let the countryside has its own characteristics, form the brand scale advantage, help rural become a professional production base of certain agricultural products.

Improve infrastructure and implement preferential policies. Early in the development of rural electricity, the government actively promote the construction of the Internet and road traffic, led by the government to promote rural electric merchant cooperation with logistics company, to create a good system environment for rural electronic commerce development, actively organize training for rural electricity business practitioners, and to focus on the development of the rural electricity business positive factors.

As poor areas are unable to solve development problems on their own, the government should introduce corresponding poverty alleviation policies to achieve targeted poverty alleviation and appropriate medicine. By providing rural loan subsidies and other measures, the threshold of farmers' loans can be lowered, so as to realize the "blood transfusion" of rural development and accelerate the process of rural financial financing. We can also develop a talent introduction incentive system to attract e-commerce merchants into the district and promote the development of rural e-commerce.

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