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Challenges and Countermeasures for Rural E-commerce Development in China under the Rural Revitalization Strategy

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Abstract

Under the background of the Rural Revitalization Strategy, rural e-commerce has become an important engine for advancing agricultural and rural modernization. This paper systematically summarizes the notable progress achieved in the development of rural e-commerce in China, particularly in terms of policy support, infrastructure, market scale, and participating entities. It also deeply analyzes the challenges it faces, such as regional imbalance in infrastructure, a shortage of professional talents, the incomplete quality system for agricultural products, and insufficient supply chain resilience. Based on these findings, this paper proposes targeted countermeasures from four dimensions: improving infrastructure, strengthening the cultivation of professional talents, improving quality and safety systems, and optimizing the supply chain. These countermeasures aim to provide theoretical references and practical paths for promoting the high-quality development of rural e-commerce in China and comprehensively supporting rural revitalization.

Keywords

Rural Revitalization; Rural E-commerce; Supply Chain.

1. Introduction

The Rural Revitalization Strategy is an important measure for addressing issues concerning agriculture, rural areas, and farmers in China in the new era, and the digital economy has provided new impetus to rural development. As a key link connecting urban and rural areas and reconstructing the production and sales pattern of agricultural products, rural e-commerce has become a core engine for advancing agricultural transformation and upgrading, increasing farmers' income. In recent years, with the support of national policies, rural e-commerce in China has made significant progress in infrastructure and logistics network construction, and the market scale has continued to expand. However, beneath the surface of its vigorous development, deep-seated structural contradictions have become increasingly prominent: regional imbalance in infrastructure, a severe shortage of interdisciplinary talents equipped with both agricultural knowledge and digital skills, the non-standardization of agricultural production and the incomplete quality traceability system make it difficult to establish consumer trust, and insufficient coordination and vulnerability of the supply chain restrict industrial development. Therefore, this paper aims to comprehensively review the development status of rural e-commerce in China, deeply analyze the practical bottlenecks it faces, and propose optimization countermeasures, so as to provide references for subsequent research and a theoretical basis for policy formulation and practical innovation.

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2. The Development Status of Rural E-commerce in China

2.1. Increasing Policy Support

The growth of rural e-commerce has become a key driver for promoting rural economy, expanding sales channels for agricultural products, and creating local employment opportunities. The acceleration of this development process has benefited from robust policy guidance. Relevant policies clearly stipulate measures such as establishing multi-level comprehensive service platforms for rural e-commerce and accelerating the construction of modern rural logistics distribution systems, providing unprecedented strategic opportunities and policy support for rural e-commerce. Driven by the Rural Revitalization Strategy, rural e-commerce is accelerating its upgrade towards digitalization and intelligence, fostering new forms of rural industries, effectively stimulating market vitality and farmers' enthusiasm, and providing solid and powerful support for rural revitalization.

2.2. Gradually Improving Infrastructure

Technological advancement and improvements in rural infrastructure have laid a solid foundation for the development of rural e-commerce in China, and also provided strong support for the flow of agricultural products to urban markets and the delivery of consumer goods to the countryside. In terms of network communication, China Mobile has achieved extensive coverage of broadband and mobile networks, narrowing the digital divide between urban and rural areas. In terms of logistics, the three-level distribution network from county-level logistics centers to township stations and then to village-level service points is taking shape rapidly, and express delivery services are extending to rural communities. At the same time, the improvement of specialized facilities such as county-level cold chain storage and the optimization of cold chain logistics have effectively alleviated the fresh-keeping and transportation problems of agricultural products, reducing transportation losses and logistics costs[1].

2.3. Rapidly Growing Market Scale

Rural online retail sales and online sales of agricultural products in China have maintained a growth trend for several consecutive years, and have become an important channel for agricultural product sales and a core driving force for the growth of the rural consumption market. According to business data monitoring, in 2025, rural online retail sales in China reached 3 trillion yuan, and the online retail sales of agricultural products reached 783.31 billion yuan, growing by 6.7% and 9.9% year-on-year respectively. From the perspective of structure, agricultural product categories such as fresh agricultural products, local specialty foods, and handicrafts have become increasingly diverse and have shown significant growth; the breadth and depth of supply of industrial products have continuously expanded, stimulating the increasingly diverse and high-quality consumption demands of rural residents.

2.4. Diversified Participants

The participants in rural e-commerce have gradually evolved from individual online merchants in the early stage to a diversified structure encompassing leading agricultural industrialization enterprises, farmers' specialized cooperatives, family farms, and market forces such as e-commerce platforms and supply chain service providers. At present, the group of "new farmers", represented by returning college students, veterans and rural youth, is rapidly emerging. With their digital skills and innovative awareness, they are becoming a key force driving the development of rural e-commerce.

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3. Challenges in the Development of Rural E-commerce

3.1. Regional Imbalances in Infrastructure Construction

There is an obvious regional disparity in rural infrastructure. Although the goal of broadband access in every village has been basically achieved, in the remote mountainous areas of the central and western regions, there are still problems with unstable broadband signals. Some areas also face unstable power supply, which is insufficient to support high-definition live streaming, online communication, and other related aspects, thereby restricting the development of new business models such as live e-commerce[2]. Facilities for processing agricultural products below the county level, such as pre-cooling points and sorting and packaging stations, are scarce, and the storage facilities are rudimentary, unable to meet the basic storage needs of agricultural products. In addition, some rural roads are narrow, rugged, and complex, making it difficult for large transport vehicles to pass through. This further intensifies the constraints of infrastructure on the development of rural e-commerce.

3.2. Shortage of Professional E-commerce Talents

The contradiction between the supply and demand of talents in rural e-commerce is prominent. The scientific and cultural literacy of the local rural labor force is relatively low, making it difficult for them to undertake tasks such as operating e-commerce platforms and conducting online marketing. Most young people returning to their hometowns for entrepreneurship only have basic operational skills, and their e-commerce capabilities cannot meet the diversified development needs of the current industry[3]. At the same time, there is a significant gap in the employment environment and public services between rural and urban areas. This has caused the loss of local talents and difficulties in introducing external professional talents. Even those who have completed basic training tend to seek development in big cities, resulting in the dilemma of “difficulty in attracting, retaining and developing talents”.

3.3. Incomplete Quality System for Agricultural Products

The insufficient supervision of agricultural product quality and safety, as well as non-standard processing, has seriously undermined consumers’ trust, becoming a major threat to the sustainable development of rural e-commerce. There are issues of overlapping management at the regulatory level and inconsistent standards. The work of various departments lacks effective coordination, making it difficult to form regulatory synergy. The production process is restricted by the decentralized production and operation model of small-scale farmers. There is a lack of unified quality grading, production and processing, and packaging standards for agricultural products, resulting in uneven quality of similar products. At the same time, the construction of the quality traceability system for agricultural products is insufficient. The application scope of traceability technologies such as the Internet of Things and blockchain is limited, making it hard to realize full-process information traceability covering production, processing and circulation. Consumers are unable to accurately grasp the source and quality of the products. Some producers and operators have short-sighted behaviors of prioritizing sales volume over quality, sacrificing quality to pursue low-price competition, which not only easily leads to consumer complaints but also damages the overall reputation of regional agricultural products, creating an industry trust crisis.

3.4. Problems in the Agricultural Product Supply Chain

Structural problems in the agricultural product supply chain are the key factors restricting the high-quality development of rural e-commerce. The supply chain itself has a lengthy process, covering multiple links such as agricultural product cultivation, processing, transportation, and sales. Once coordination among these links is inadequate, it will lead to low overall circulation efficiency and even bring about the serious risk of supply chain disruption. More fundamentally,

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there is a clear information barrier between production and sales. Farmers have difficulty in obtaining market demand data in a timely and accurate manner. Coupled with the long production cycle and slow adjustment of agricultural products, it is easy to cause a mismatch between production arrangements and actual market demand, resulting in regional shortages or surpluses. At the same time, crops are highly susceptible to external factors such as natural disasters and market price fluctuations, making the stability of the supply chain seriously insufficient. The drastic fluctuations in output and prices pose great risks to the stable operation of e-commerce. In addition, in the face of increasingly diverse and immediate consumer demands, online sales of agricultural products still overly rely on traditional channels, and the application of new models such as live-streaming e-commerce and social retail is insufficient, further limiting the growth space of rural e-commerce.

4. Countermeasures for the Development of Rural E-commerce

4.1. Enhancing Infrastructure Development

4.1.1. Improving Digital Infrastructure

Accelerate the construction of rural broadband and mobile networks. Direct the special funds for rural e-commerce towards remote mountainous areas in the central and western regions, as well as areas below the county level. Focus on supporting the extension of 5G networks and gigabit broadband to villages, while simultaneously upgrading rural power grids, ensuring the stable operation of digital applications such as high-definition live streaming and online transactions, and improving the operational efficiency of e-commerce.

4.1.2. Optimizing the Logistics System

Accelerate the establishment of a three-level intelligent logistics system from counties to townships and then to villages, and build mobile cold storage facilities for fresh agricultural products to address the issues of storage, grading and processing of agricultural products. At the same time, use modern information technology to build a rural e-commerce logistics information platform. By integrating logistics transportation data, this platform can provide accurate logistics solutions for rural e-commerce[4]. Additionally, optimize rural road conditions, widen roads in remote rural areas, and promote seamless connectivity between rural roads and logistics stations to ensure the passage of large transportation vehicles and unblock the "last mile" of agricultural product transportation.

4.2. Strengthening Professional Talent Development

4.2.1. Cultivating Local E-commerce Talents

Based on the demand for e-commerce talents in rural areas, collaborate with the government and e-commerce platforms to offer targeted integrated agricultural and e-commerce courses. Conduct basic e-commerce operation training for left-behind farmers to help them master core skills such as platform registration and order processing; for young people returning to rural areas, focus on strengthening professional skills such as market promotion, data analysis, and brand planning to help them grow into backbone personnel in e-commerce operations. At the same time, organize a special assistance program led by local e-commerce influencers to enhance the effectiveness of talent cultivation through hands-on e-commerce practices.

4.2.2. Strengthening Talent Attraction

On the one hand, policies such as tax reductions, entrepreneurial subsidies and interest-free loans can be implemented to lower the threshold for entrepreneurship, so as to make rural e-commerce more attractive to talent. On the other hand, collaboration can be established with universities to launch talent recruitment programs for rural e-commerce, establish training

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bases in rural areas, and provide internship and employment opportunities for graduates, attracting them to settle and develop at the grassroots level.

4.2.3. Optimizing the Environment for Talent Retention

Improve basic public service conditions and the working and living environment, improve the salary levels and career development prospects of rural e-commerce practitioners, and establish a sound talent evaluation and incentive mechanism. Through measures such as professional title assessment and commendations, enhance the sense of belonging of talents and address the problems of "difficulty in attracting, retaining and developing talents"[5].

4.3. Strengthening the Quality and Safety System for Agricultural Products

4.3.1. Promoting Full-chain Standardization

Led by relevant government authorities or industry associations, local standards for the entire industrial chain of harvesting and processing, grading and packaging, storage and transportation, and sales should be formulated and promoted. Through the cooperation model among enterprises, production bases and farmers, scattered production should be incorporated into unified management and made to follow standardized operating procedures. At the same time, the authorized use and dynamic exit mechanism for regional public brands should be established, linking the brand usage rights closely to the level of standardization compliance. The market value of the brand should be leveraged to promote production standardization and quality upgrading.

4.3.2. Establishing a Digital Traceability and Supervision Mechanism

Establish and promote an agricultural product quality and safety traceability platform based on the Internet of Things and blockchain technologies. Guide large-scale producers to use the platform to record and preserve key information on agricultural products from sowing and harvesting to purchasing and consumption, ensuring that the information is stored online and cannot be tampered with. Promote interconnection among this traceability platform and the data systems of market supervision, agriculture and other departments to achieve the sharing of regulatory information and law enforcement coordination. On this basis, establish convenient query channels for consumers and a risk early warning system for regulatory authorities to achieve transparent traceability and intelligent supervision. At the same time, establish open and transparent credit files for operators, and use the market mechanism to achieve premium pricing for high-quality products and the elimination of inferior ones.

4.3.3. Strengthening Quality and Safety Assessment Management

Establish a regular quality and safety assessment mechanism. Conduct assessments through a combination of on-site operations, ledger verification, and online quizzes. Link the assessment results closely to quality credit files. Those who pass the assessment can enjoy incentives such as policy support and platform traffic privileges. Those who fail the assessment will be required to rectify within a specified period of time and receive targeted supplementary training and re-examination. Those who fail multiple assessments will be placed on the key supervision list. Through strict assessments, promote the implementation of quality and safety requirements.

4.4. Optimizing the Agricultural Product Supply Chain

4.4.1. Establishing a Digital Production and Sales Platform

Break the information barriers between production and sales through digital transformation, build a regional agricultural big data platform, establish channels for sharing production and sales information, and integrate all regional production and sales information resources. Utilize big data analysis technology to accurately predict market demand, promptly send guidance information such as variety selection and yield planning to farmers, promote precise matching between agricultural production and market demand, solve the problem of information silos at

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the source, and address the issue of supply-demand disconnection caused by information barriers.

4.4.2. Integrating and Upgrading the Agricultural Product Supply Chain

Establish an integrated supply chain system of "planting - processing - storage - sales", reducing intermediate circulation links. Draw on the experience of digital agriculture project construction, optimize the collaborative efficiency of each link in the supply chain through digital technologies, and enhance the overall operational and circulation efficiency. At the same time, develop innovative data-driven supply chain finance, encourage financial institutions to provide flexible financing services for business entities of each link in the supply chain based on platform transaction data and logistics warehouse receipts, so as to effectively alleviate the Pressure Of Capital Turnover, And Ensure The Efficient Operation Of The Supply Chain.

4.4.3. Strengthening Supply Chain Stability

Vigorously develop contract agriculture, guide farmers to sign long-term supply agreements with e-commerce enterprises, establish agricultural product price insurance and risk compensation mechanisms, and effectively resist external shocks such as natural disasters and market price fluctuations. Actively expand diversified sales channels, encourage e-commerce entities to adopt new models such as live-streaming marketing, social retail, and community group buying, strengthen cooperation with mainstream e-commerce platforms to obtain traffic support, create exclusive sales channels for regional public brands, promote the integration of online and offline sales models, enhance the flexibility and market adaptability of the supply chain, and improve the overall risk resistance capacity.

5. Summary

Rural e-commerce, as an important force in boosting rural revitalization, has a development performance that directly bears on the progress of agricultural and rural modernization. At present, rural e-commerce in China has established a solid foundation, providing strong support for its high-quality development. However, deep-seated problems including regional imbalance in infrastructure, a shortage of professional talents, an incomplete quality system for agricultural products, and insufficient supply chain resilience have restricted the full realization of its potential. To promote the sustained and healthy development of rural e-commerce, it is necessary for the government, the market, and society to collaborate and implement measures such as infrastructure improvement, talent development, quality control and supply chain upgrading, so as to effectively break through the development bottlenecks. In the future, as digital technology penetrates deeply into agriculture and rural areas and all links in the industrial chain achieve coordinated upgrading, rural e-commerce will surely play a more crucial role in promoting agricultural modernization, narrowing the urban-rural gap, and achieving comprehensive rural revitalization.

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