

# Research on the Coordinated Development of Rural Digital Economy and Agricultural and Rural Modernization in Tianjin under the Background of Rural Revitalization

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**Abstract:** The development of rural digital economy is an inevitable choice for rural revitalization, and it is also an inevitable trend of rural modernization and urbanization in China, and the 20th National Congress emphasized the need to focus on the development of digital economy and strengthen the deep integration of digital economy and rural revitalization. As a strong cornerstone of China's real economic development, agriculture and rural areas can form five major effects with the support of the digital economy, which are mainly reflected in industry, ecology, culture, governance and income increase, which is the key point to promote the high-quality development of rural revitalization. With the vigorous development of the digital economy, the rural areas of Tianjin are undergoing digital transformation, which brings unprecedented opportunities for agricultural production and rural development. On this basis, this paper studies the relationship between rural digital economy and agricultural and rural modernization, the dilemmas and existing problems. It further puts forward countermeasures to promote the coordinated development of rural digital economy and agricultural and rural modernization in Tianjin, and help accelerate the process of rural revitalization.

**Keywords:** Rural Revitalization; Digital Economy; Synergistic Development

## 1. Introduction

The rural revitalization strategy will be fully implemented, and the pace of agricultural and rural modernization will be significantly accelerated and effective. Looking forward to 2035, the comprehensive revitalization of rural areas will achieve key breakthroughs, and the goal of agricultural and rural modernization will be basically achieved. In 2024, the No. 1 document of the Central Committee and the State Council on learning and using the experience of the "Thousand Village Demonstration and Ten Thousand Village Renovation" project to effectively and effectively promote the comprehensive revitalization of rural areas" emphasizes that in order to realize the modernization process with Chinese characteristics, it is necessary to continue to strengthen the fundamental position of agriculture, comprehensively promote the revitalization of rural areas, and take rural revitalization as the core strategy to solve the "three rural" problems on the road of development in the new era.

Since the 18th National Congress, China's digital economy has entered an accelerated development cycle, which has played an important role in promoting the modernization of agriculture and rural areas. The scale has increased from 11.2 trillion yuan in 2012 to 53.9 trillion yuan in 2023, an increase of 3.8 times in 11 years. Among them, it took about 6 years for the scale of the digital economy to grow from 10 trillion yuan to 30 trillion yuan, and only about 4 years to grow from 30 trillion yuan to 50 trillion yuan. In 2023, stimulated by a series of favorable policies of the CPC Central Committee, the scale of China's digital economy will expand steadily, with an increase of 3.7 trillion yuan over the previous year, and the expansion of the growth rate will enter a relatively stable range. The Tianjin government attaches great importance to the construction of digital villages and actively promotes rural informatization to improve the level of rural digital economy, and in terms of proportion, the proportion of Tianjin's digital economy in GDP has exceeded 50% in 2023. By the end of 2021, more than 2,500 5G base stations had been built in Tianjin, and more than 80% of the broadband Internet coverage in Tianjin's rural areas covered the vast rural areas. Among them, the "10 Gigabit" broadband coverage rate has reached more than 85%, providing high-speed and stable network services for rural residents. In order to further promote the coordinated development of rural digital economy and agricultural and rural modernization in Tianjin, this study mainly focuses on the relationship,

influencing factors and policy system between the development of digital economy and agricultural and rural modernization, emphasizes the important role of digital economy in promoting the development of agricultural and rural modernization, and finds the reasons and proposes corresponding development countermeasures.

## **2. The Relationship between Rural Digital Economy and Agricultural and Rural Modernization**

### ***2.1 The Construction of Digital Villages Is an Urgent Requirement for the Modernization of Agriculture and Rural Areas***

The construction of digital villages is a key driving force to reduce the dual economic structure in the process of urbanization, narrow the "digital divide", and promote economic and social development and rural revitalization, which is conducive to improving agricultural production efficiency, promoting the expansion of agricultural product markets, and increasing farmers' income[1]. From the perspective of agricultural production, the construction of digital villages introduces modern information technology, such as precision agriculture technology (comprehensive application of satellite positioning, geographic information, remote sensing technology, etc.), which can accurately grasp soil fertility, crop growth, meteorological changes and other information, realize precise sowing, fertilization, irrigation and pest control, improve the efficiency of agricultural resource utilization and reduce waste. In terms of market expansion of agricultural products, the construction of digital villages has built a convenient communication bridge, and with the help of e-commerce platforms, farmers can understand the dynamics of market demand in a timely manner and adjust the type and scale of products. Digital marketing methods such as short videos and live streaming make the sales of agricultural products more vivid and intuitive, attract more consumers, broaden sales channels, and increase farmers' income. From the perspective of rural governance, the construction of digital villages improves the efficiency and accuracy of governance, builds an intelligent governance platform, realizes the openness, transparency and efficient transmission of government information, and allows villagers to easily understand policies and regulations, work processes, and give feedback and suggestions. In terms of environmental governance, public security prevention and control, digital monitoring equipment and intelligent sensors can monitor data and conditions in real time, find and solve problems in a timely manner, create a good environment, and provide guarantee for the modernization of agriculture and rural areas.

### ***2.2 The Connotation and Structure of the Development of Rural Digital Economy***

The development of the digital economy will inevitably promote the digital transformation of the entire society[2]. Digital technology is the foundation of rural digital economy and digital rural development. If we want to develop digital technology in rural areas, the first task is to promote the popularization of rural informatization. The architecture of the rural digital economy can be divided into three layers: at the bottom is the infrastructure layer, including networks, data centers, etc.; The application layer of the middle layer covers many fields such as agricultural production, rural management, and rural services; The top layer is the policy and talent support layer, which provides policy guarantee and talent support for the development of the rural digital economy. These three levels cooperate with each other and develop in synergy, so as to build the overall architecture of the rural digital economy. Due to the differences in the quality of farmers and the level of economic and social development, the gap in rural infrastructure has gradually expanded, which has also led to a large gap in the intermediate application layer.

### ***2.3 The Relationship between Rural Digital Economy and Agricultural and Rural Modernization***

Agricultural and rural modernization is the core strategy of rural revitalization, which strongly drives the development of rural digital economy. In the process of promoting the modernization of agriculture and rural areas, the foundation for the development of rural digital economy has been laid by upgrading information infrastructure, applying agricultural modernization technology, and cultivating rural informatization talents [3]. This process has made it easier for rural areas to obtain information and promoted the upgrading of the agricultural industrial structure in a more optimal direction. At the same time, the modernization of agriculture and rural areas has led to the vigorous rise of emerging industries such as rural e-commerce, rural tourism, and rural logistics, opening up a larger market space for the rural digital economy.

On the contrary, the modernization of agriculture and rural areas will also be deeply promoted by the development of the rural digital economy. The infrastructure and talent support of rural modernization are indispensable for the development of the rural digital economy, which can stimulate application innovation and improve the overall level of rural modernization. It can be seen that the relationship between the two is interdependent and synergistic, which is of great significance for promoting the development of rural revitalization (see Figure 1).

To sum up, the rural digital economy and agricultural and rural modernization are interdependent and mutually reinforcing. Only by strengthening the synergy and mutual progress of the two can we promote the sustainable and healthy development of the rural economy and society and achieve the grand goal of rural revitalization.

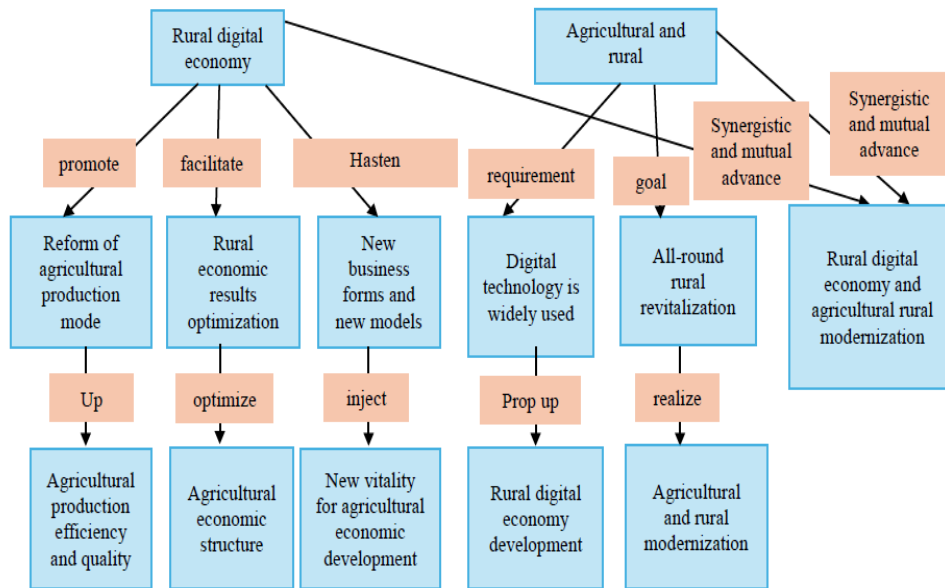


Figure 1: Mechanism of synergy and mutual promotion of rural digital economy and agricultural and rural modernization

### 3. Problems Existing in the Coordinated Development of Rural Digital Economy and Agricultural and Rural Modernization

#### 3.1 Farmers Lack the Intrinsic Motivation for the Development of the Rural Digital Economy

The digital transformation of agricultural production is extremely unfamiliar in the eyes of most farmers, lacking understanding and trust in new technologies and new models, and unwilling to try to use digital economic means to improve their production efficiency and product quality. If digital technology cannot produce real benefits to farmers in the short term, then they will subconsciously resist and reject it, which is manifested in their low enthusiasm to participate in digital production and lack of subjective initiative [4]. The digital upgrade of agriculture requires a lot of financial support, and the price of digital equipment itself is high, and the output is far less than the input cost at the stage of initial use, which reduces the initiative of farmers to participate in it. In addition, the lack of substantive participation of farmers in the rural development affairs of their villages, most of them do not have the opportunity to participate in the public affairs of their villages, thus limiting the role of the digital economy in the process of agricultural and rural modernization.

#### 3.2 The Efficiency of Digital Village Governance Is Not Good, and the Collaborative System Needs to Be Improved

Driven by the digital economy, some new forms of "digital villages" have emerged, and the results of rural governance have also begun to appear. With the initial emergence of governance results, many problems of rural grassroots governance in Tianjin have also emerged, which is mainly manifested in the imperfect information sharing mechanism, the insufficient construction and application of

information platform, the lack of diversified governance system, the large gap with the goal of rural governance of co-construction, sharing and co-governance, and the data barriers between various departments have not been broken. The low information literacy of relevant staff, the lack of data awareness and concepts, the difficulty of shaking the traditional governance thinking, the defects in the construction of rural digital platforms, and the lack of efficient operation and maintenance have seriously weakened the effectiveness of digital governance in rural society [5], making it difficult to effectively integrate and utilize agricultural data.

### ***3.3 Lack of High-Quality Digital Talent***

At present, in the rural areas of Tianjin, although farmers own two factors of production, land and labor, they lack the corresponding primitive capital accumulation, data and information and other factors of production. The talent training model for digital literacy is not yet perfect, and the talent cultivation system composed of enterprises, governments, and society also needs to be further improved. With limited educational resources and a small number of technical talents, it is difficult for rural local talents to receive training in digital knowledge, and they will be cautious when using digital equipment, holding the idea of "I would rather not use it than use it". There is a scarcity of professionals who understand the application of key digital technologies such as big data analysis, artificial intelligence, and Internet of Things applications in agricultural scenarios, making it difficult to meet the needs of rural digital infrastructure construction and system maintenance.

## **4. Countermeasures for the Coordinated Development of Rural Digital Economy and Agricultural and Rural Modernization**

### ***4.1 Stimulate the Internal Development Motivation of Farmers***

Attaching great importance to and strengthening the improvement and training of farmers' information literacy needs to be achieved through rich and diverse channels and flexible methods, to publicize the practical benefits that the development of the digital economy can bring to farmers themselves, and to explain in detail how the digital economy has changed their production models, sales channels and lifestyles, so that farmers can deeply understand their dominant position and key role in the development of rural digital economy. This study makes full use of the village affairs bulletin board, radio, wechat public account and other convenient information dissemination platforms to regularly and continuously release the latest information related to the development of digital economy and policy interpretation content. In the village affairs bulletin board, eye-catching posters and interpretation materials of digital economy policies are posted to facilitate farmers to understand in a timely manner when they pass by in their daily lives. This study uses radio to broadcast easily understandable digital economy knowledge and preferential policies to improve farmers' policy awareness. Farmers who actively participate in the construction of digital villages will be commended and rewarded, and farmers who participate in the management of public affairs will be given certain subsidies or remunerations, and more farmers will be encouraged to actively participate in the process of developing the digital economy in their villages.

### ***4.2 Improve Governance Effectiveness and Synergy***

At present, the state has successively issued a number of policy documents related to digital village construction, such as the Outline of Digital Rural Development Strategy and the Digital Agriculture and Rural Development Plan (2019-2025), and the top-level design and policy framework of digital village construction have gradually taken shape. In terms of governance efficiency, this study strengthens the construction of information sharing mechanism, establishes unified standards and norms, clarifies the rights and obligations of departments, uses blockchain technology to ensure information security and traceability, and promotes interconnection. This study increases capital investment, strengthens the construction and application of the information platform, improves the function of the information platform, builds a one-stop service platform for government affairs, people's livelihood and agricultural production, carries out training, and improves the utilization rate. This study encourages multiple subjects such as villagers, enterprises and social organizations to participate in the construction of a multiple governance system. In terms of collaborative governance ability, this study establishes collaborative governance mechanisms, such as setting up online suggestion boxes to collect opinions and suggestions. This study carries out targeted training, including

courses on data knowledge and digital technology application, to improve staff quality and change traditional governance thinking. In this study, a cross-departmental data coordination team was established to break data barriers, coordinate data management and integration, unify data formats, and build an agricultural data collaboration system to achieve efficient data integration and utilization.

#### **4.3 Strengthen Talent Support and Build a Digital High-Quality Talent Team**

To promote the "digital village", Tianjin rural areas must strengthen the construction of talent team, which is a strong guarantee and important measure to promote the construction of "digital village". According to the Action Plan for Accelerating the Development of the Digital Economy (2024-2026) and the Implementation Plan for the Cultivation of Technical and Skilled Talents in the Field of Digital Economy, Tianjin has issued plans such as the "Haihe Talents" action plan, vigorously introduce digital economy talents, encourage technical talents to take root in Tianjin's countryside, and build a solid reserve force for the construction of digital villages. Second, we should actively attract entrepreneurs and investors in the digital economy to start businesses in the countryside. Specifically, by optimizing the rural business environment, streamlining the approval process, and providing appropriate government subsidies and tax exemptions, we will provide a good entrepreneurial environment for entrepreneurs and investors in the digital economy to start businesses in the countryside, and further reduce the costs and risks of entrepreneurship and investment. Third, we should strengthen the construction of digital cadres at the grassroots level. This study refers to the experience of urban digital construction and the actual situation of Tianjin rural areas to formulate digital development plans and policies to meet the needs of rural modernization. This study sets up a functional department specifically responsible for rural digital construction, sets up a team of professional cadres, leads the overall planning and coordination of related affairs and promotes the process of rural digital construction in Tianjin. Only through the above measures can we play an incentive role, make the digital economy and agricultural and rural modernization go hand in hand, and stimulate the internal power of the revitalization of Tianjin's rural areas.

#### **5. Summary**

Based on the study of the relationship between the coordinated development of digital economy and agricultural and rural modernization, the difficulties faced in the process of coordinated development and the existing problems, this paper further puts forward countermeasure to promote the coordinated development of rural digital economy and agricultural and rural modernization in Tianjin. It illustrates the importance of the coordinated development of rural digital economy and agricultural and rural modernization in Tianjin, which promotes the integrated development of rural industries, makes agriculture and rural areas develop in a smarter, more efficient and more sustainable direction, and lays a solid foundation for the comprehensive revitalization of rural areas.

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