Research on the Mechanism and Path of Digital Economy Promoting Green Development of the Agricultural Sector

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Abstract: *The rapid development of digital economy can realize the overall reform of Chinese green development of the agricultural sector from productivity to production relations. Digital economy incorporates data elements into green development of the agricultural sector, thus achieving digital governance across agricultural production, farmers' life and rural government services. However, during this period, the imbalance between digital economy and green development level in different regions, the difficulty in adjusting the digital structure of traditional rural industries, and the mismatch of digital governance services have a negative impact on the function of digital economy as an incentive for green development of the agricultural sector. To give full play to the advantages of digital economy in promoting the green development of agriculture, we should actively promote the digital transformation of traditional agriculture, explore the regional differentiation of green agriculture development mode, enhance the government's digital governance capability, and play the role of the government in the institutional protection of agricultural green development.*

Keywords: Digital economy; Green development; Driving mechanism; Path

1. Introduction

The report of China Agricultural Green Development Report 2021 shows that from 2012 to 2020, the national agricultural green development index has increased from 73.46 to 76.91, which indicates that the level of sustainable agricultural development continues to improve, and green production emerges as a new trend. In green development of the agricultural sector, agriculture is the central component, development is its means, and green is its goal. Faced with the new context and pattern of green agriculture, China should make full use of the development opportunities of digital economy, apply data elements to give agricultural productivity and production mode changes, expedite the process of the green development of agriculture, and achieve green agricultural transformation and high-quality development. Studying the influence mechanism of digital economy on the green development of agriculture is of tremendous practical importance for advancing the green development of agriculture.

2. Mechanism of digital economy promoting green development of the agricultural sector

Green development of the agricultural sector is an agricultural development model that takes comprehensive and coordinated sustainable development as its principle, adopts advanced technology to transform the agricultural production mode, pays more attention to improving the comprehensive economic benefits of agriculture, and realizes environmental conservation and environmental friendliness[1]. Digital economy utilizes digital as the production factor, relies on modern information technology, and takes the integration and application of information and communication technology and the digital transformation of all factors as the crucial driving force. Digital economy can promote the development of agriculture in a manner that is environmentally friendly in terms of production, lifestyle and governance, and form a modern green development of the agricultural sector model.

2.1. Digital technology is the driving force behind green development of the agricultural sector

Digital technology mainly refers to the Internet, big data, artificial intelligence, blockchain and other technologies. It is characterized by active innovation, intensive elements, and extensive radiation. It presents an opportunity for scientific and technological revolution and industrial transformation. As a new factor of production, data can provide fundamental and forward-looking digital information for the

green development of agriculture, and can accurately grasp all kinds of information for effective response. Data can be integrated with traditional means of production to achieve cost savings and boost output efficiency, and further increase the productivity of green agriculture. Compared with the traditional extensive agricultural development model, the green development model takes environmental factors into account, and ultimately maximizes the agricultural ecology and economic benefits. Overall, technic innovation in digital economy provides the core power for the green development of agriculture, and the resulting optimization of the agricultural industry has become an important mechanism of green development.

Digital economy employs modern information technology to promote the development, innovation, and application of agricultural-related technologies, encourage the upgrading of agricultural production methods, and extend new agricultural development concepts and models. For instance, digital information technology has given birth to agricultural e-commerce, improved the efficiency of agricultural product sales and circulation via online live broadcast sales, and formed a new agricultural industry chain of coordination among material flow, information flow and value flow, which not only improve farmers' income but promotes the upgrading of the agricultural industry and related industrial structures. In addition, developing agricultural digital technology will also alter the agricultural business model, including introducing new industrial models such as rural featured tourism, a new retail model of agricultural picking gardens, etc. The combination of new agricultural business models and digital agricultural production can effectively expand agricultural production, circulation and sales paths, improve agricultural ecology and economic benefits, achieve sustainable agricultural development, and provide new power and vitality for green development of the agricultural sector.

2.2. Digital economy promotes green development agricultural sector from the perspective of the internal mechanism

The main objective of agricultural green development is to maximize the common benefits of agricultural ecology and economics. Digital economy provides new chances for rural green development, and promotes the fundamental transformation of agricultural production mode and economic model through the internal mechanism of enhancing efficiency and industrial structure optimization. Agriculture's input-output ratio is indicative of its efficiency. More production elements will be drawn to accelerate the development of the agriculture business as efficiency rises. Therefore, encouraging green development in the agricultural sector needs to improve agricultural production efficiency to attract more production factors.

Digital economy incorporates modern information technology, data resources and other elements into the green development of agriculture, increases the types and quantities of input elements, changes the status quo of over-reliance on traditional production factors, improves agricultural efficiency, and promotes green development. As a production factor, data has the advantages of low cost and easy dissemination, which makes agricultural production have the characteristics of low input, low energy consumption and high output, and the transmission of shared information resources provides a new tool for agricultural green transformation. First, digital economy can improve the cleaning rate in the agricultural production process. The advantages of digital economy, such as low marginal cost, high-speed information transmission and effective operation mode, are integrated with agricultural production, which promotes the improvement of labor efficiency of agricultural production and enables the transition to agriculture with low pollution, low resource consumption and high cleanliness. Second, data economy has strengthened the supervision of agricultural pollution. With the digital transformation of rural areas, all links in agricultural production are overseen by the Internet. Meanwhile, the use of advanced agricultural technology can effectively plan pollution control, optimize the allocation of pollution control resources, promote the governance of the agricultural ecology, and accelerate the intensive and green transformation of the agricultural industry. Third, the digital economy has facilitated the digitization of rural green industries. In the past, the development of the agricultural industry was more dependent on cheap labor and high consumption of natural resources in rural areas, which was a quantitative expansion industry development model that hindered the establishment of the high-quality rural industry value chain. Digital economy can replace traditional production factors to stimulate the reconstruction of the agricultural industry value chain. In the past, China's rural industries had problems such as decentralized spatial distribution, small scale, single structure and low industrial efficiency, necessitating a change in the existing industrial structure to be more market-oriented. The development of rural digitalization can reduce the resource costs of rural industries, develop new markets such as the leisure tourism industry with rural characteristics, optimize industrial-related infrastructure mechanisms, and promote the upgrading of agricultural green industrial structure. The reconstruction of the rural industrial chain by

digital technology has resulted in the emergence of new industrial forms and models in rural areas, constantly improving the development of green products in rural industries, making rural featured tourism, featured products and other green industries more feasible, breaking the time and space constraints in rural areas, and effectively expanding the boundaries and demand space for green development of the agricultural sector.

3. Realistic restriction of digital economy promoting green development of the agriculture sector

The practice of digital economy in promoting green development of the agricultural sector faces numerous obstacles, such as gaps in the level of digital economy and green development in different regions, difficulty in adjusting the digital structure of traditional rural industries, and mismatch of digital governance services, all of which will diminish the incentive effect of digital economy on green development of the agricultural sector.

3.1. Gaps in the level of digital economy and green development in different regions

The eastern region with a higher level of economic development has a faster growth of digital economy and green development, while the central and western regions are relatively backward. The economic development, technological innovation and other factors will affect the development of a region's digital economy, and will also affect the level of green development of the agricultural sector. Cross-influence caused by these factors further exacerbates the imbalance and discord of green development of the agricultural sector levels in different regions.

3.2. Inadequate connection between digital economy and green development of the agricultural sector

Digital economy and green agricultural development are not a simple combination; rather, modern digital information technology needs to be integrated into all aspects of green agricultural development, thereby essentially promoting the fundamental change of green agriculture. At present, however, China's agricultural green development and digital economy development are not tightly intertwined. In some regions, the support of digital technology for agricultural green development is insufficient, and the use of digital technology falls short of the true requirements of agricultural green development. The application of agricultural green development to digital information technology is limited to changing the sales mode of agricultural products through the e-commerce industry, but digital economy has not been deeply applied to all stages of the agricultural green industry, preventing the formation of a comprehensive and systematic digital management model to promote the process of rural green development[2]. The slow development of the digital market, the absence of large-scale application channels in green development of agriculture, and the insufficient development of the agricultural industry embodying the digital characteristics make the data elements and the agricultural green industry fail to form an efficient convergence, thereby affecting the incentive role of digital economy in the green development of agriculture.

3.3. Digital governance capability needs to be improved

Market failure leads to the fact that the green development of agriculture depends more on the participation of the government, and the weak digital governance ability of the government has become the bottleneck of digital economy to promote the green development of agriculture[3]. The government's weak awareness of data collection can hardly promote the government's comprehensive management and allocation of various digital resources, which will affect the circulation efficiency of digital elements in agricultural industry development and hinder the green development of agriculture. In addition, the green development of agriculture requires effective communication and business sharing between various government departments. However, the lack of effective data integration and sharing between departments makes it difficult for the government to provide efficient data services in green development. Currently, enterprises and the general public involved in the green development of agriculture are not willing to participate in government-led digital construction actively, and the effectiveness of mobilizing diverse subjects to participate in the green development of agriculture is significantly diminished.

4. The path choice of digital economy promoting green development of the agricultural sector

Currently, China's agriculture has not yet accomplished the parallel development of economic growth

and environmental protection, and green development of agriculture still has numerous flaws. Therefore, full use of the efficiency and technological advantages of digital economy should be used in the green development of agriculture in China, targeted policies and initiatives at different levels should be formulated in different regions to promote the process of green development of agriculture, and create a modern green development model of agriculture.

4.1. Promoting the differentiated regional development models

Digital economy promoting agricultural green development should account for the differences in area resources, then explore regional diversification of agricultural development models. First, take relatively perfect regions as examples, actively promote the deep cooperation between agriculture and other industries, fully release the advantages of data elements, gather the necessary factors of digital economy and agricultural green development, and accelerate the efficient connection between digital economy and agricultural green development. Second, we should encourage green development of agricultural growth in accordance with the resource endowments of diverse regions. The eastern region can utilize the advantages of technology, capital and talents to accelerate the transformation of the agricultural industry[4]; the central region can utilize the advantages of geographical location and population size to promote digital consumption mode of agricultural products; and the western region can utilize resource advantages, such as coal resources in northern Shaanxi, to promote the use of clean energy in agriculture and increase the utilization rate of new energy. Third, according to the characteristics and requirements of different links in the development of the agricultural industry, accelerate the development of digital circulation mode, and promote online and offline cooperation to improve the sales scale of agricultural green products, thereby forming a large-scale market demand for green agricultural products. At the same time, the digital resource advantages of different regions are used to eliminate the circulation barriers in the green development of agriculture, realize the sharing of resources and data in a wider scope, optimize the circulation channels in the development of the agricultural industry, reduce the circulation costs to the greatest extent to promote the development of green agricultural products-related industries, and then effectively form a stable digital circulation model.

4.2. Promote the digital transformation of traditional agriculture and develop the power of the digital economy to empower green development of the agricultural sector

To promote the digital transformation of traditional agriculture, it is essential to accelerate the rapid application of modern digital technology in the traditional agricultural industry, comprehensively raise the level of networking and intelligence in the development of the agricultural industry, and realize the green and efficient combination of production factors in agriculture with the help of digital resources, so as to promote the green transformation of agriculture. First, we should strengthen the transformation of traditional agriculture through digital technology. Using big data resources and modern information technology to integrate digital economy with traditional agriculture, promoting the integration of digital economy into each core process of agricultural green industry development, embedding data elements in each link from production factor selection, production process to sales process, thereby form a modern, networked and intelligent new agricultural green development model. The second is to open up the sales channels of green agricultural products with the help of digital platforms. Encourage enterprises with competitive advantages in agriculture to build a digital platform, directly meet the demand for green agricultural products in the city from production, sales and other links, reduce the cost in the circulation link, and thence stimulate relevant small-sized and medium-sized enterprises to carry out the division of work and cooperation, which can accelerate the formation of a complete, efficient green industry circulation channel. Third, play the role of the market mechanism. The construction of infrastructure required by digital economy in green agricultural development needs to play the role of the market mechanism, combine social capital and government investment to reconstruct more efficient and environmentally friendly digital infrastructure services, and provide material support for the transformation of green agricultural development[5].

4.3. Improve the digital governance capability of the government and give play to the role of the government's system guarantee

Improving the government's digital governance capacity is essential for ensuring the role of digital economy in supporting the green development of agriculture. In the process of green development agricultural sector, different departments at all branches of the government should make full use of data resources to deal with government public affairs efficiently, accelerate the promotion of data resource

sharing systems in different organizations, regions and businesses, especially in the field of environmental pollution in agricultural development, which can be comprehensively monitored, and establish high-quality and effective agricultural ecological data systems. In addition, as the related policy supplier, the government can use digital resources to mobilize the active participation of other economic entities in agricultural green development, eliminate the information asymmetry barriers between different economic entities, explore the construction of coordination mechanisms and incentive mechanisms between different entities in the green agricultural development, and truly promote the common coordinated governance process of green agricultural development.

5. Conclusions

Digital economy provides new opportunities and impetus for green development of the agricultural sector. The application of digital economy in agriculture can save agricultural costs, improve agricultural production efficiency, and transform agricultural structure to form a modern agricultural green development model. At present, there are many problems in China, such as the gap between the digital economy and the green development level in different regions, the difficulty in adjusting the digital structure of traditional rural industries, and the mismatch of digital governance services, which restrict digital economy to enable rural green development. Therefore, in the current stage of China's agricultural green development, we should make full use of the efficiency and technical advantages of the digital economy, formulate targeted multi-level policy initiatives in different regions to promote the process of agricultural green development, and create a modern agricultural green development model.

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