

# The Impact of the Internet on the Development of Agricultural Product Value Chain

Xinyi Li, Xiang Li

Cooperative Economics Research Center, Anhui University of Finance and Economics, Bengbu 233041, China

**Abstract:** With the popularization and rapid development of the Internet, the development of the value chain of agricultural products has also been profoundly affected. The purpose of this paper is to study the application of the Internet in the production, processing, circulation, consumption and extension of each link in the value chain of agricultural products, analyze the impact of the Internet on the development of the value chain of agricultural products, and point out the problems of information security and value chain financing of agricultural products in the process of promoting the development of the value chain of agricultural products, so as to put forward countermeasures and suggestions to promote the development of agricultural products e-commerce and cross-border e-commerce of agricultural products, improve the Internet application ability of farmers, and increase the support for the value chain financing of agricultural products. This is of great significance for promoting the deep integration of the Internet and agriculture and promoting the realization of agricultural modernization in China.

**Keywords:** Agricultural value chain; Internet; Modernization of agriculture.

## 1. Introduction

The reform and opening up has greatly liberated and developed China 's agricultural productivity. China 's traditional agricultural development path has continued to transform and upgrade, that is, from the expansion of production to the development of modern agriculture that focuses on the quality of agricultural products and increases the competitive advantage of agricultural products. The value chain of agricultural products is also constantly extending, from the most basic production, processing, circulation and consumption to the expansion of links that include more services and products.

In recent years, under the background of the wide application of the Internet and various industries, the combination of agricultural industry and the Internet is one of the ways to accelerate agricultural modernization in China. This paper will observe and analyze the combination of Internet and agriculture from the production, processing, circulation, consumption and extension of the value chain of agricultural products, so as to study the impact of Internet platform on the value chain of agricultural products, which is of great significance to promote the deep integration of Internet and agriculture.

## 2. Agricultural Products Value Chain

The value chain refers to a series of activities that create value. The value chain of agricultural products is a series of activities that add value to the value of agricultural products in the whole process of production, processing, circulation and consumption. With the continuous extension of the value chain of agricultural products, the cultivation of ' new farmers ' and the supply of means of production of agricultural products are extended to the upstream, the service of agricultural products is extended to the downstream, and the investment and financing of the whole industry of the upstream and downstream are provided. In this series of activities, multiple stakeholders are involved. Therefore, if the value chain of agricultural products can be operated

efficiently, it is beneficial to the various stakeholders in the agricultural industry. Accelerate the realization of agricultural modernization goals [1].

The value chain of agricultural products can be further subdivided into the cultivation of ' new farmers ', the supply of agricultural production materials, the production of agricultural products, the acquisition and storage of agricultural products, the processing of agricultural products, the wholesale and retail of agricultural products, and the consumption of agricultural products. The value chain of agricultural products is shown in Figure 1:

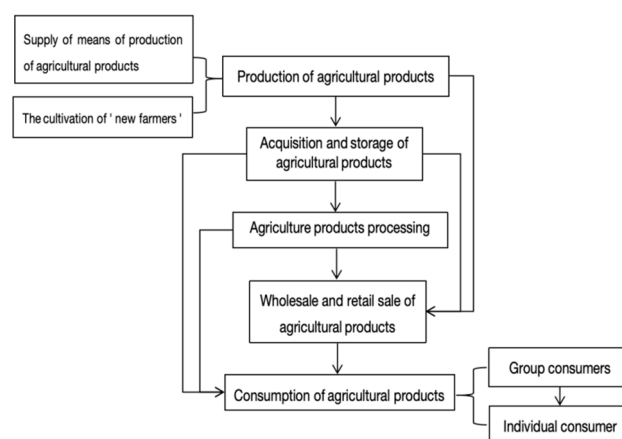


Figure 1. Value chain of agricultural products

## 3. The Impact of The Internet on All Aspects of The Value Chain of Agricultural Products

Through the information platform of the network, the redistribution of resources is realized, the deep integration of Internet information technology and traditional industries is promoted, the development model of traditional industries is changed, the innovation and productivity of traditional industries are improved, and a new economic development model with Internet as technical means and implementation

tools is established. It can stimulate the innovation vitality of relevant economic entities and bring more development opportunities. The deep integration of Internet and agriculture is an important way to realize agricultural informatization, activate the driving force of agricultural development, and promote the transformation and upgrading of agricultural production mode. The deep integration of the Internet and agriculture is the only way for China to move from a large agricultural country to a strong agricultural country in the new era.

### **3.1. The impact of the Internet on agricultural production**

The impact of the Internet on the production of agricultural products is mainly reflected in information support and production organization optimization, which can improve the yield and quality of agricultural products. The Internet can provide farmers with timely and accurate agricultural information, including weather forecasts, pest control, agricultural market conditions, etc., to help farmers make more scientific decisions and improve the yield and quality of agricultural products. Through the Internet platform, farmers can exchange information and cooperate with agricultural experts, suppliers, cooperatives, etc., realize the large-scale, professional and refined management of agricultural production, and improve the yield and quality of agricultural products.

With the development of Internet technology, agricultural machinery and equipment are constantly updated, and production efficiency is also constantly improving. On the premise of maintaining a certain amount of agricultural production, it can not only save resources, but also shorten labor time, so that workers have more time and energy to engage in other agricultural production activities, and improve the sustainable productivity of agriculture. At present, the production equipment used in the production process of agricultural products is increasingly showing the development trend of intelligence and digitization, which improves the accuracy of decision-making in the production process, reduces the production cost and improves the production efficiency. In agricultural production, Internet technology can be used to monitor and control the temperature and humidity in agricultural greenhouses in real time, and automatic fertilization and irrigation can be realized. Such a scientific management mode greatly improves agricultural productivity and makes agricultural production more intelligent and effective. At the same time, when problems occur in agricultural production, we can trace the source of the problems, deal with the root causes of the problems, and finally realize the standardization of agricultural production.

### **3.2. The impact of the Internet on the upstream extension of the value chain of agricultural products**

#### **3.2.1. Cultivating ' new farmers '**

The biggest difference between this group of ' new farmers ' and traditional farmers is that they can better understand and judge the new technologies and new methods in Internet agriculture, and have strong learning ability. They are willing to apply new network technologies to all aspects of agricultural production and management. The emergence of a large number of ' new farmers ' will inevitably promote the

further integration of the first, second and third industries of agriculture, enhance productivity, promote the transformation of agricultural production mode, promote the transformation of agricultural supply-side structure, and accelerate the pace of agricultural modernization.

### **3.2.2. Supply of means of production of agricultural products**

The means of production of agricultural products include pesticides, fertilizers, seeds and other agricultural means of production. By using the Internet platform, the effective exchange of information among agricultural production supply enterprises, circulation enterprises and agricultural production enterprises has been realized, the transaction cost has been reduced, and the effective transaction rate has been improved. Agricultural means of production supply enterprises can use the analysis ability of big data to supply appropriate amount of agricultural materials according to the needs of agricultural production, promote the e-commerce platform of agricultural materials to gradually replace the traditional agricultural materials circulation system, and improve the efficiency of supply and demand docking.

### **3.3. Impact of the Internet on the acquisition and storage of agricultural products**

The loss of agricultural products in transportation is relatively large, the cost of preservation is relatively high, and the transportation cost of agricultural products will be too high when the transportation volume of agricultural products is not up to standard, which makes the economic pressure on farmers larger and hinders the circulation and sales of agricultural products [3]. However, the use of Internet technology can improve the level of cold chain logistics technology, which can reduce the transportation cost of agricultural products and reduce the transportation cost. Second, it can promote the sharing of logistics information, and transmit and process relevant information such as the number of agricultural products in advance, which can prevent high transportation costs or unmanned transportation caused by insufficient transportation [4]. The sharing of logistics information is also convenient to adjust the production structure of agricultural products and reduce the waste of resources according to the needs of the market.

### **3.4. The impact of the Internet on the processing of agricultural products**

Internet technology has had a positive impact on the processing of agricultural products. First of all, the Internet has promoted the informatization and intelligence of agricultural product processing links, more efficiently managed the production process, improved the efficiency and quality of agricultural product processing, reduced production costs, and improved market competitiveness. Secondly, Internet technology can expand the sales channels of agricultural products processing and improve market competitiveness. Direct communication and sales with consumers through e-commerce platforms and online retail of agricultural products can realize online sales and distribution of agricultural product processing and reduce the cost and risk of intermediate links.

### **3.5. The impact of the Internet on the circulation of agricultural products**

The Internet has changed the mode and mode of circulation

of agricultural products, breaking the monopoly of traditional circulation channels. Through the establishment of e-commerce platform and logistics distribution system, the online sales and offline distribution of agricultural products have been realized, and the agricultural products have been sold directly to consumers. Reduce intermediate links, reduce circulation costs, improve the sales efficiency and coverage of agricultural products, and also provide new channels and means for the brand building and marketing of agricultural products, so as to improve the visibility and reputation of products, increase consumers' willingness to purchase, and further promote the sales and market competitiveness of agricultural products.

### **3.6. The impact of the Internet on the consumption of agricultural products**

First of all, the Internet provides consumers with a convenient shopping experience. Consumers can buy high-quality agricultural products through e-commerce platforms without being limited by time and place. Consumers can order directly through mobile phones, computers and other terminal equipment, eliminating the time and energy costs of traditional shopping. Secondly, the Internet provides consumers with more information about agricultural products, including sources, quality, production processes, etc. Consumers can obtain the evaluation and recommendation of other consumers through search engines, social media and other channels, so as to better understand the real situation of agricultural products and improve their trust in agricultural products. Furthermore, the Internet enables consumers to customize the types, specifications and distribution methods of agricultural products according to their tastes, health needs, etc., to meet personalized purchase needs. Finally, through the Internet technology, the relevant information of agricultural products can be obtained in real time, and then through the establishment of a traceability system for agricultural products, consumers can trace the production, processing and circulation of agricultural products, which helps to find and solve potential quality problems and improve the transparency and credibility of the entire agricultural product supply chain. This not only helps to maintain the safety of food quality, but also helps to protect the rights and interests of consumers.

### **3.7. The impact of the Internet on agricultural products services**

The organic integration of Internet technology and agricultural products services can not only enhance the service pertinence of agricultural products service organizations, but also improve consumers' information acquisition ability. Through the Internet, agricultural product service organizations can establish a good interactive relationship with consumers, so that the degree of specialization of their services and customer satisfaction has been greatly improved. The value chain of agricultural products has expanded from the production, processing and sales of agricultural products to tourism and other industries, and some new forms have emerged, such as sightseeing picking, sightseeing catering, fishing and barbecue. This new format is more inclined to serve the agricultural product market, based on planting, driving the development of secondary production and tertiary production, thus bringing more economic benefits [ 5 ].

### **3.8. The impact of the Internet on agricultural value chain financing**

The application of Internet technology provides more opportunities and possibilities for the value chain financing of agricultural products. Using the Internet financial platform to provide financing services for the value chain of agricultural products, through online financing, to provide farmers with more convenient and flexible financing channels. The Internet platform can also provide crowdfunding services for agricultural products, raise funds for farmers through crowdfunding, and support the production and sales of agricultural products. These new financing methods can effectively alleviate the financing problems of farmers, improve the production efficiency and quality of agricultural products, and also provide investors with more investment opportunities. In addition, the application of Internet technology can also improve the credit rating and risk management ability of agricultural enterprises, thereby reducing the financing cost of agricultural product value chain and improving the transparency and efficiency of agricultural product value chain financing.

## **4. The Problems of The Internet in Promoting the Development of Agricultural Product Value Chain**

### **4.1. Information security issues need to be improved**

At present, China's rural network infrastructure has achieved full coverage, and rural digital infrastructure has been continuously improved. As of June 2022, the national rural Internet penetration rate has reached 58.8%, and the gap between urban and rural Internet penetration rate has been shortened by nearly 15 percentage points compared with the early stage of the 13th Five-Year Plan. However, while the Internet makes the circulation of information more convenient, it also brings some information security problems. Due to the large and messy amount of information on the Internet, coupled with the fact that some agricultural product information platforms are not perfect enough, in the value chain of agricultural products, the pertinence of effective information dissemination on the Internet is poor. In rural areas, farmers often get some false news, and farmers are not able to identify effective information. If these false information is widely spread, it will have a significant impact on farmers' arrangements for agricultural production. In addition, the spread of false news on the Internet will also cover up the real news of benefiting farmers. For example, the information sent by the local agricultural technology promotion department is often mistaken by farmers as promotional advertisements, which will cause farmers to be unable to select from these information. The information that is really useful for agricultural production makes farmers distrust the Internet and generate fear, thus weakening the effect of the Internet on improving the production efficiency of agricultural products.

### **4.2. The problem of farmer training needs to be improved**

At present, there are still a certain number of farmers who cannot make full and effective use of the Internet to make them at the end of the agricultural product value chain, unable to effectively organize and lead the construction and

operation of the agricultural product value chain, and there is still room for improvement in the production efficiency of agricultural products. At the same time, farmers face the problem of information asymmetry in the market when they trade, which leads to their disadvantage in the transaction process. They lack an accurate understanding of market demand and prices, may face higher transaction costs and opportunity costs in agricultural products trading, profit margins will be reduced. However, the current farmer training work is faced with many problems, such as the large number of farmers, the weak foundation, and the unreasonable training time arrangement. It is impossible to ensure that farmers can learn practical knowledge. In addition, due to the lack of relevant reasonable training system and norms, the lack of professional training teachers, so that the enthusiasm of farmers to participate in training is not high, the quality of training can not be guaranteed.

#### **4.3. The production and operation of agricultural products rely too much on big data.**

Due to the organic combination of the Internet and the production of agricultural products, the number of e-commerce platforms for agricultural products is increasing, which promotes the production efficiency of agricultural products and improves the profit margin of agricultural products. The production of agricultural products has the problem of over-reliance on big data for decision-making, especially in rural areas. This phenomenon is very serious. The production of agricultural products is completely guided by big data. Ignoring big data may also lead to distortions, which is not conducive to the development of agricultural product markets and is harmful to the development of agricultural product value chains.

#### **4.4. Value chain financing of agricultural products**

There are many small agricultural production organizations, agricultural processing organizations and agricultural sales organizations in the agricultural product value chain. Due to the inability to reasonably judge the financial situation and operational capabilities of these organizations, as well as the information asymmetry between organizations and financial institutions and the lack of effective collateral, these organizations are always difficult to obtain financing from traditional formal financial institutions. [ 6 ]. At the same time, the price of agricultural products fluctuates greatly. Considering the weak ability of these small organizations to resist risks, financial institutions are reluctant to lend to the agricultural sector.

### **5. Countermeasures and Suggestions to Promote the Application of The Internet in The Value Chain of Agricultural Products**

The Internet plays an important role in the value chain of agricultural products, which can promote the production, circulation and sales of agricultural products, and improve the added value and market competitiveness of agricultural products. At the policy level, the No.1 Central Document emphasizes the use of the Internet to change the traditional mode of agricultural production, so as to promote the

development of agriculture in the direction of scale, standardization and efficiency, and improve the overall efficiency of agricultural production. This paper puts forward some suggestions on promoting the application of the Internet in the value chain of agricultural products :

#### **5.1. Promote the development of e-commerce and cross-border e-commerce of agricultural products**

Encourage agricultural producers and circulation enterprises to use the Internet platform for transactions, but also through the Internet platform to provide agricultural technology and information services, improve the production efficiency and quality of agricultural products. At the same time, the government can strengthen the supervision of the e-commerce platform of agricultural products, and can also establish a traceability system of agricultural products based on blockchain technology, improve the quality and safety of agricultural products, enhance consumer confidence, and protect the rights and interests of consumers. Support the development of cross-border e-commerce of agricultural products, encourage agricultural export enterprises to use the Internet platform to carry out cross-border e-commerce, expand the international market, and promote the export of agricultural products. At the same time, the government can increase investment in the construction of rural logistics system, encourage enterprises to participate in agricultural products logistics, improve farmers ' logistics awareness and skills, and promote the circulation and sales of agricultural products.

#### **5.2. Improve the Internet application ability of farmers**

Focus on the training of farmers ' Internet technology application and vocational skills, strengthen the training and promotion of agricultural products e-commerce platform and agricultural products traceability system, improve farmers ' information acquisition and communication ability, understand market demand and price changes, so as to make more accurate decisions. Farmers need to strengthen the cultivation of organizational and leading capabilities in order to better participate in the construction and operation of the agricultural product value chain. In addition, farmers can master the thinking method of ' Internet + ', so as to cultivate their creativity in using the Internet to engage in all aspects of the value chain of agricultural products. This is also to cultivate rural informatization professionals and new professional farmers, improve the comprehensive quality of rural labor force, and better use of advanced agricultural production technology, create the necessary human capital conditions.

#### **5.3. increase support for agricultural value chain financing**

The government can introduce relevant policies to support the development of agricultural product value chain finance. Through Internet information technology, it can improve information transparency and circulation efficiency, reduce information asymmetry, improve the accuracy of credit evaluation, solve the problem of insufficient collateral, and improve the financing capacity of agricultural value chain. Encourage financial institutions to cooperate with agricultural e-commerce platforms to provide farmers with more

convenient and flexible financing services and promote the production and circulation of agricultural products.

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