

Research on the Mechanism and Path of Digital Transformation of Agricultural Production in Anhui Province

Chuanqi Gu^{1,*}, Junfen Hu¹, Zhixin Pan², Weiyang Yu¹

¹School of Economics, Anhui University of Finance and Economics, 233000, Anhui, China

²School of Accountancy, Anhui University of Finance and Economics, 233000, Anhui, China

*Corresponding author: 2732397420@qq.com

Abstract

Breaking through the dilemma of traditional agricultural development and promoting the digital transformation of agricultural production is the only way for the high-quality development of agriculture in Anhui Province. By analyzing the operation process of the digital transformation of agricultural production in Anhui Province, this paper finds that the multi-interest connection mechanism is an operating mechanism with certain common characteristics in the transformation process. Through empirical analysis, the dilemma faced by the implementation subjects playing a key role in the digital transformation of agricultural production in Anhui Province is analyzed, institutional innovation is proposed as the way out of the digital transformation of agricultural production in Anhui Province, and countermeasures are proposed from the level of agriculture-related subjects, in order to provide effective suggestions for the digital transformation of agricultural production in Anhui Province.

Keywords

Agricultural production; Digital transformation; Multi-interest linkage mechanism; Empirical analysis; Institutional innovation.

1. INTRODUCTION

The report of the 20th National Congress of the Communist Party of China stressed that China should speed up the construction of an agricultural power and further promote the modernization of agriculture and rural areas. After the victory of the 20th National Congress of the Communist Party of China, the CPC Central Committee and the State Council publicly issued the "Opinions on Comprehensively Promoting the Key Work of Rural Revitalization in 2023", proposing to strengthen the support of agricultural science and technology and equipment and promote the high-quality development of rural industries. The digital transformation of agriculture is an inevitable requirement for the green and sustainable development of agriculture and an important way to promote the modernization of agriculture and rural areas. The application of digital technology to agricultural production can provide more powerful scientific and technological support for agricultural production, and can also promote the digital transformation of the agricultural industry, thereby promoting the high-quality development of the agricultural industry.

In the process of the digital transformation of agricultural production in Anhui Province, the provincial people's government has formulated and issued a number of policy plans, and agricultural enterprises, farmers, and relevant scientific research institutes have also played their respective roles under the leadership of the people's government to jointly promote the

digital transformation of agricultural production. However, there are still many problems in the digital transformation of agricultural production in Anhui Province, such as the low efficiency of digital factor technology and the shortage of compound talents with science and technology and labor management. To further promote the digital transformation of agricultural production in Anhui Province, these problems need to be solved urgently. Therefore, it is important to study the mechanism and path of digital transformation of agricultural production in Anhui Province to discover and solve a series of related problems.

2. THE OPERATION MECHANISM OF THE DIGITAL TRANSFORMATION OF AGRICULTURAL PRODUCTION

2.1. The government plays a guiding and driving role in providing policy guidance for the digital transformation of agricultural production

In the process of digital transformation of agricultural production in Anhui Province, it is difficult to achieve significant results by relying only on the support of digital technology, and it is also necessary for the government to provide correct policy guidance and increase capital investment to provide institutional guarantees for digital transformation. First of all, the Anhui provincial government has increased capital investment in agricultural production digital technology, increased financial support for scientific research institutes and agricultural production digital enterprises, combined with the rural revitalization strategy of Anhui Province and the actual situation of various places, to achieve precise support, and fundamentally solve the problem of capital shortage in the process of digital transformation of agricultural production in Anhui Province. At the same time, the government actively explores the development model of agricultural production by continuously guiding scientific research institutes and agricultural production enterprises, so that they can make full use of advanced information technology to improve their own digital infrastructure construction. With the continuous improvement of digital infrastructure construction, the big data platform of digital agriculture has gradually been built and developed, the utilization efficiency of agricultural production factors and resources has steadily improved, and the improvement of agricultural production digital facilities has greatly reduced the operating costs consumed in the process of digital transformation of agricultural production in Anhui Province, and promoted the effective transformation of agricultural production digitalization.

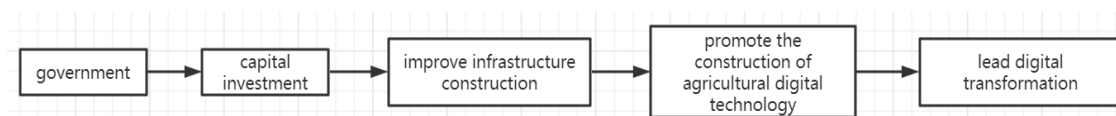


Figure 1. Government operating mechanism

2.2. Scientific research institutes play a role in transformation and guidance to provide scientific and technological support for the digital transformation of agricultural production

Scientific research institutes closely follow the relevant policies and guidelines of the government on the digital transformation of agricultural production, put the policies into practice, and let more agricultural enterprises and farmers understand the policies and participate in the field of agricultural digital economy. After receiving the government's digital agriculture subsidies, on the one hand, implement the innovation-driven development strategy, guide professional and technical personnel to participate in the digital construction of agricultural production, vigorously carry out agricultural production technology research and development, develop emerging production technologies, apply advanced technologies to the whole process of agricultural production, regularly monitor the application effect of new

technologies, and improve the deficiencies. Strengthen the exchange between technical personnel of scientific research institutes and technical personnel of agricultural enterprises, and promote the further improvement of scientific and technological literacy of scientific and technological personnel of enterprises; On the other hand, agricultural production technology should be updated and transformed, making full use of agricultural idle resources, improving resource utilization efficiency, improving agricultural productivity, and reducing agricultural production costs. On the basis of implementing government policies, the research institute implements corresponding measures according to the actual situation of agricultural enterprises and farmers in various regions, and implements accurate digital guidelines with the goal of improving the digital level of agricultural enterprises and the digital literacy of farmers.

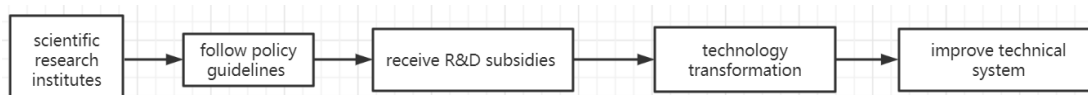


Figure 2. The operating mechanism of scientific research institutes

2.3. Agricultural enterprises play a collaborative and leading role in providing implementation methods for the digital transformation of agricultural production

In the process of digital transformation of agricultural production, agricultural enterprises should not only closely follow the government's policy guidelines, but also actively cooperate with scientific research institutes to transform the achievements of emerging technologies, and also actively lead farmers to participate in the digital transformation of agriculture. Agricultural enterprises cooperate with the government, the government provides policy and financial support for the digital transformation of agricultural enterprises, and agricultural enterprises should actively cooperate with the government to implement various measures, such as assisting the government in the construction of digital infrastructure for agricultural production, following the government's policy call, and actively promoting the digital transformation of the entire agricultural production through its own digital transformation. Agricultural enterprises cooperate with scientific research institutes, scientific research institutes provide technical support for their digital transformation, and agricultural enterprises should actively help scientific research institutes to transform the achievements of digital technology, and help scientific research institutes discover the strengths and weaknesses of technology, so that they can be improved and upgraded. Agricultural enterprises should also be good at using these digital technologies to promote their own digital transformation, so as to improve the efficiency of enterprise operations, reduce enterprise operating costs, and promote the digital transformation of agricultural production. For farmers, agricultural enterprises should take the initiative to play a leading role. On the one hand, it provides relevant digital publicity and education for farmers to promote the transformation of farmers' thinking; On the other hand, digital technology is used to help farmers carry out agricultural production activities, so that farmers can truly feel the convenience brought by the digitalization of agricultural production.

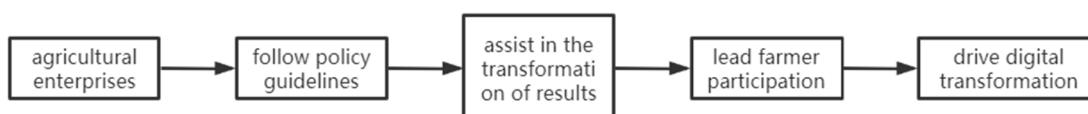


Figure 3. Agricultural business operation mechanism

2.4. Farmers play the main role in providing the core impetus for the digital transformation of agricultural production

Farmers are the main body of agricultural production activities, and they are also the main subjects and witnesses of the digital transformation of agricultural production. To promote the digital transformation of agricultural production, farmers need the support and help of other subjects, but what is more important is their own thinking transformation and practical actions. On the one hand, farmers need to actively accept the education and publicity of the government, colleges and related enterprises, actively learn the technology and knowledge related to the digital transformation of agricultural production, promote the transformation of their own thinking, and cultivate the digital thinking of agricultural production. On the other hand, farmers should dare to change the forms and methods of agricultural production, actively accept digital technologies and products to help them carry out agricultural production activities, and learn to use and utilize these technologies and products. The transformation of individual farmers' thinking and actions is the digital transformation of individual agricultural production, and the digital transformation of individual agricultural production can promote the digital transformation of agriculture as a whole.

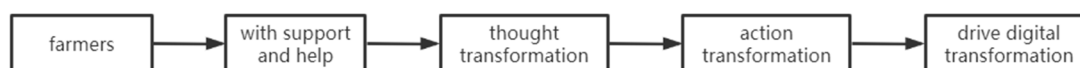


Figure 4. Farmer operation mechanism

3. THE DILEMMA OF AGRICULTURAL PRODUCTION TRANSFORMATION UNDER THE BACKGROUND OF DIGITAL ECONOMY

3.1. The government's deployment of new agricultural infrastructure is insufficient.

Compared with industry, less funds have been obtained in the process of agricultural digital transformation, and traditional agricultural production still accounts for the vast majority, making the digital infrastructure construction of agricultural production in Anhui Province still in a very weak state, and a series of problems such as low digital coverage, insufficient and unstable network bandwidth, and unskilled farmers in operating digital equipment have slowed down the digital transformation process of agricultural production in Anhui Province. In addition, Anhui Province lacks agricultural big data standards and agricultural digital resources are not fully integrated, which makes the utilization of agricultural digital resources inefficient, the use of agricultural digital resources and equipment expensive, and the digital transformation needs of agricultural production and operation entities cannot be effectively met.

3.2. There is a lack of deep integration between digital technology and agriculture in scientific research institutes.

First of all, the relatively poor agricultural development environment in Anhui Province makes the number of professional research institutions for agricultural digitalization insufficient, which also leads to the low coverage of agricultural production in Anhui Province as a whole. Secondly, the salary of agricultural research institutes in Anhui Province is not high, there is a serious lack of talents related to agricultural digitalization, and the development of digital technology cannot be further guaranteed. Finally, the small financial subsidies of scientific research institutes hinder the further improvement of agricultural production equipment and technology, and the low production efficiency has led to the high operating costs of agricultural production subjects, and the lack of deep integration between digital technology and agriculture.

3.3. Agricultural enterprises are deeply constrained by cost effects.

Due to the limited capital of agricultural enterprises themselves, and the small profit space of the agricultural industry, the equipped with emerging equipment and technology will occupy a large amount of cash flow, and the development of agricultural enterprises will be difficult in the early stage of operation, and the negative impact of its cost effect is more far-reaching than the performance brought by the innovation-driven effect, making it easier for agricultural production and management entities to lose business momentum. With the continuous development of economy and society, technological innovation will be an important goal of the future development direction of agricultural enterprises, but the continuous improvement of agricultural production technology will also make agricultural enterprises in a long-term adaptive state, digital technology will impact traditional agricultural production technology, promote the digital transformation of enterprises.

3.4. Farmers' input in digital factors is low

First of all, farmers' digital literacy is insufficient, and they lack a clear understanding of agricultural production digital equipment, and believe that there is still a certain gap between agricultural products produced by applying digital technology in agricultural production and traditional production methods. Second, most farmers are not proficient in operating the emerging digital equipment for agricultural production, and are not fully prepared to adapt and apply the new digital equipment for agricultural production. Influenced by farmers' traditional attitudes, they fear that their identities and assets will be replaced in the process of digital transformation. All of this makes the endogenous driving force of the digital transformation of agricultural production in Anhui Province insufficient, hindering the digital transformation of agricultural production in Anhui Province.

4. CONCLUSIONS AND RECOMMENDATIONS

The digital transformation of agricultural production in Anhui Province has the following difficulties: first, the government's insufficient deployment of new agricultural infrastructure; Second, there is a lack of deep integration between digital technology and agriculture in scientific research institutes; Third, agricultural enterprises are deeply constrained by cost effects; Fourth, farmers' investment in digital factors is low. From the perspective of the four themes of government, scientific research institutes, agricultural enterprises and farmers, this paper analyzes the mechanism of the digital transformation of agricultural production in Anhui Province from the perspective of multiple agriculture-related subjects. The government plays a guiding and leading role in providing policy guidance for the digital transformation of agricultural production in Anhui Province. Scientific research institutes play a role in transformation and guidance to provide scientific and technological support for the digital transformation of agricultural production in Anhui Province. Agricultural enterprises play a collaborative and leading role in providing implementation methods for the digital transformation of agricultural production in Anhui Province. Farmers play the main role in providing the core driving force for the digital transformation of agricultural production in Anhui Province.

4.1. The government strengthens the deployment of new agricultural infrastructure.

Increase financial investment in digital agriculture, and allocate special funds for problems encountered in the digital development of agricultural production, so as to improve the utilization rate of financial funds. Strengthen the construction of digital infrastructure for agricultural production. Improve rural Internet coverage, strengthen the maintenance and upgrading of 5G base stations, network broadband and other basic equipment, effectively solve

problems such as low rural Internet coverage and unstable broadband speed, and improve the efficiency of equipment use.

4.2. Accelerate the deep integration of digital technology and agriculture in scientific research institutes.

Set up more digital agricultural research institutions in a targeted manner, increase the salary and treatment of staff of agricultural research institutes, and accelerate the introduction of talents related to agricultural digitalization. Increase financial subsidies for scientific research institutes, promote the iterative upgrading of agricultural production equipment and technology, and improve the efficiency of the use of agricultural digital technology.

4.3. Strengthen relevant subsidies for agricultural enterprises.

Strengthen policy support for agribusiness. The government can promulgate relevant laws and regulations to give certain policy support to agricultural enterprises, such as optimizing the business environment and reducing taxes. Strengthen economic support for agribusiness. Increase financial subsidies for agricultural enterprises, and provide economic incentives for outstanding enterprises and outstanding results, so as to increase the enthusiasm of agricultural enterprises for production.

4.4. Improve the professional quality of agricultural digitalization practitioners.

Strengthen digital literacy training for farmers. The government, agricultural enterprises and rural cooperatives can train farmers on digital literacy and the use of digital facilities from time to time, improve farmers' awareness of agricultural digitalization, and strengthen their psychological construction. Governments, agribusiness and rural cooperatives can coach farmers to use digital production equipment and improve their proficiency. And in the process of agricultural digital transformation, we must give full play to and use the potential of farmers, and do not let machines completely replace human labor.

ACKNOWLEDGMENTS

This study is funded by School of Economics, Anhui University of Finance and Economics Undergraduate Scientific Research Innovation Fund Project (Grant No.: ACJJXYZD2304).

REFERENCES

- [1] HAN Xudong, LIU Chuang, LIU Huguang. The theoretical logic and practical path of the digitalization of the whole agricultural chain to promote the transformation of rural industry [J/OL]. Reform, 2023-03-27.
- [2] CHEN Dengyuan, WANG Ganmin. Deep integration of digital technology and rural revitalization: internal logic, practical dilemma and improvement path [J]. Journal of Shihezi University (Philosophy and Social Sciences), 2023, 37(01): 31-36.
- [3] LI Yuan, RUAN Lianjie. Expansion path and policy orientation of Chinese-style agricultural and rural modernization under the background of digital economy [J/OL]. Journal of Xi'an University of Finance and Economics, 2023-03-27
- [4] DUAN Longlong, QI Miao, YANG Lan. Research on the mechanism and realization path of agricultural production trusteeship to promote rural industry revitalization——Based on the survey of Sichuan Province [J]. Agricultural Economics, 2023, 429(01): 14-16.
- [5] LIU Xuexia, CHEN Chuanlong. Research on the path of digital technology to promote the transformation and upgrading of agricultural industrial structure [J]. Administrative Management Reform, 2022, 160(12): 57-65.

- [6] LU Zhaoyang, DU Yutong. An empirical study on the high-quality development of agriculture empowered by digital economy [J].China Circulation Economy, 2022, 36(11):3-14.
- [7] Xiao Zhongyi. Research on the practical mechanism of digital transformation of agricultural production [D].Jiangnan University, 2022.
- [8] Guan Hui, Lei Juanli. Data Elements Empower Agricultural Modernization: Mechanism, Challenges and Countermeasures [J].China Circulation Economy, 2022,36(06):72-84.
- [9] CHEN Yangjun. Research on high-quality development of agriculture driven by digital economy [D].Southwestern University of Finance and Economics, 2022.
- [10]XIE Wenshuai, SONG Donglin, BI Yifei. Journal of Soochow University(Philosophy and Social Sciences), 2022,43(02):93-10.
- [11] Glushchenko VA. Analysis of the impact of state support on the efficiency of agricultural production in the context of digitalization in the Volgograd region [J]. IOP Conference Series: Earth and Environmental Science, 2020, 548(8).