

Research on Countermeasures of High Quality Science and Technology Supply in Henan Province to Boost Rural Development

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Abstract: With the upgrading of industries and the development of emerging technologies, all industries are facing transformation and upgrading. As a major agricultural province, Henan province cannot develop its rural economy without the supply of science and technology. In recent years, the supply of high-quality science and technology has been regarded as the source of high-quality economic development. Based on this background, this paper makes an investigation and analysis of the high-quality science and technology supply in Henan province to help the rural revitalization and development, and explores the path of the high-quality science and technology supply to help the rural revitalization and development.

1. Introduction

General Secretary Xi Jinping pointed out: "Science and technology are the foundation of a strong nation, and innovation is the soul of national progress." The party's 19th congress report pointed out that scientific and technological innovation should be used to promote the high-quality development of the rural economy. According to the report on agricultural and rural development in Henan province in 2018, the proportion of R&D investment in Henan province in the total R&D investment in the country has steadily increased in the past five years, with an annual growth rate of 3%. However, due to the starting point of development, historical accumulation and other reasons, the overall level of scientific and technological innovation resources supply in Henan Province is not high, and the scale and intensity of R&D investment are low.

As a major agricultural province, Henan Province's rural economy accounts for an important proportion of its overall economy. With the rapid development of industrialization and urbanization in Henan Province, all kinds of economic factors, especially labor force, capital and technology, are converging to the city, leading to a growing gap between urban and rural development. Scientific and technological innovation is the key to revitalizing the rural economy, and the key to realizing agricultural modernization lies in scientific and technological progress. In order to give full play to the link between agricultural science and technology innovation and popularization and application subjects, the Henan provincial government has also actively formulated relevant measures. In 2018, Henan Province trained more than 1,000 backbone technicians in basic agricultural technology and recruited 151 special agricultural technicians. This directly allows experts to sink to the grassroots level step by step and directly help farmers in poor areas. We will vigorously promote advanced technologies such as smart agriculture and green production increase in poor rural areas, carry out coordinated innovation of standardized planting and breeding technologies and agricultural product storage and processing technologies, and speed up the reform of grass-roots agricultural technology extension system and the implementation of construction projects in rural areas.

High-quality scientific and technological supply refers to scientific and technological innovation oriented to innovation, coordination, green, openness and sharing of five development concepts, grasping the pulse of new scientific and technological revolution and industrial transformation, and defining the future development direction. This paper studies the evaluation and path of the impact of high-quality science and technology supply on the development of rural economy in Henan Province. Through the combination of qualitative and quantitative methods, scientific data results are obtained, which can deepen the understanding of the current situation of science and technology promoting agriculture and stimulate scientific and technological innovation to make more

contributions to the high-quality development of rural economy. It is helpful to promote the comprehensive development of rural economy in Henan Province. This will provide the basis for “the transformation of rural economy from high growth to high quality development”.

The 19th National Congress Report proposed that since Chinese economic development pattern changed from a high-speed growth stage to a high-quality development stage, the high-quality economic development has attracted the attention of the Henan provincial government and has become an important target and guiding ideology for Henan's economic development. At the same time, the issue of high-quality economic development has attracted extensive attention of experts, and high-quality economic development has been discussed from different angles. As the endogenous power of economic development, scientific and technological innovation is an important angle to study the problem of high-quality economic development.

2. Research Review

In CNKI, 693 documents were searched using “high quality technology supply” as the key word, mainly from 2017 to 2019. There are 237 documents searched by taking “Henan Agricultural Science and Technology Innovation” as the key word. This part of the literature takes 2017 as the time node. The literature before 2017 mainly focuses on the research of agricultural production technology in scientific and technological innovation. The literature after 2017 mainly explores the impact of scientific and technological development on agricultural economy in combination with the era background of rural revitalization and agricultural modernization. The summary is as follows:

2.1 From the Perspective of Empirical Analysis

Some scholars believe that science and technology can help the development of agricultural modernization and promote the agricultural economy. By collecting data and using empirical analysis methods, the contribution of science and technology investment to agricultural economic growth is analyzed. For example, Xue Xuandeng (2019) and others used DEA model to measure the agricultural production efficiency of Henan Province in the past ten years from both static and dynamic aspects. Finally, they proposed to improve the technical level and the input scale of factors to increase the total agricultural output value of Henan Province and boost the revitalization of villages. Yang Shanfeng (2019) selects the data of the past ten years, quantifies the characteristic agricultural industrial cluster in Henan Province and explores the path of innovation and upgrading. It believes that the development of characteristic agricultural industrial cluster is the only way to realize the modernization of agriculture and the revitalization of villages. Chen Zhen (2018) and others proposed to optimize the allocation of agricultural science and technology input factors and countermeasures in Henan Province by using quantitative analysis methods. Huang Huiying (2018) used principal component analysis to analyze the evaluation index system of towns, scientific and technological innovation and agricultural modernization, and finally proposed to promote the development of agricultural modernization through scientific and technological innovation, so as to provide a basis for urbanization. Chen Zhen (2013) and others explored the role of science and technology in the development of agricultural modernization by measuring the contribution rate of agricultural science and technology progress in Henan Province.

2.2 From the Perspective of Innovative Operation of Agricultural Science and Technology

This part of scholars investigated the current situation of the existing agricultural science and technology innovation system, team, alliance, science and technology park and science and technology test base, analyzed the existing problems, and put forward the countermeasures for sustainable development of agricultural science and technology innovation. Ren Le (2019) studied the management performance evaluation and management mode innovation of Henan Agricultural Science and Technology Park, and provided suggestions for promoting the construction of Henan Agricultural Science and Technology Park. Zhao Bo (2018) analyzed the existing problems in the development of agricultural scientific research system in Henan Province, created a coordinated

development system for innovation of agricultural scientific research system, and provided new development ideas for coordinated innovation of agricultural scientific research in Henan Province by adjusting discipline layout and promoting demonstration results. Wang yakun (2017) conducted a survey on the current situation of the strategic alliance for agricultural science and technology innovation in Henan province. The research found that Henan Province has a strong demand for agricultural science and technology, insufficient scientific and technological output, unsmooth transformation of scientific and technological achievements and high transaction costs. It is urgent to explore an enterprise-oriented and market-oriented innovation mechanism for the industry of production, study and research in order to break through the bottleneck of agricultural modernization in Henan Province. Sun Hu (2016) took the modern agricultural science and technology experimental demonstration base of Henan Academy of Agricultural Sciences as an example to study the construction of agricultural science and technology innovation and integration demonstration base in the new era, and put forward relevant countermeasures.

2.3 From the Perspective of the Importance of Scientific and Technological Talents

This part of scholars in the research of science and technology to assist the development of agricultural modernization, in the proposed countermeasures highlighted the cultivation and introduction of scientific and technological talents is very key. Sui Liping (2017) believes that agricultural science and technology innovation plays an important role in promoting agricultural modernization and sustainable development in Henan Province, and puts forward corresponding countermeasures to improve agricultural science and technology innovation in terms of capital, talents, technology promotion and policy innovation. Zhu Xianping (2017) believes that the key to the development of modern agriculture is the innovation of agricultural science and technology. To strengthen the construction of modern agricultural science and technology innovation system in Henan Province, it is necessary to deepen the reform of agricultural science and technology system, establish a cooperative innovation mechanism integrating production, teaching and research, an efficient agricultural technology extension service and a perfect talent introduction mechanism for scientific and technological innovation.

2.4 From the Perspective of High-Quality Science and Technology Supply

The research on “high-quality science and technology supply” mainly focuses on “healthy tourism, ecological area construction, characteristic town construction and clean energy”. For example, Xu Mengzhou (2019) took Hangzhou Future Science and Technology City as an example to study the high-quality development mode of characteristic towns without science and technology parks, and proposed that characteristic towns and science and technology parks should coexist and win-win. In 2018, Zhongtang Town in Dongguan City actively promoted the construction of characteristic intelligent science and technology ecological town in Jianshui Township, taking the road of high-quality economic development. Xin Wang (2019) draws lessons from the advanced experience of foreign countries that have relatively perfect health care tourism, and believes that Chinese health care tourism should take “culture+science and technology” as the promotion path to promote the high-quality development of Chinese health care tourism. Huang Qi (2019) studied the coordinated innovation of energy and science and technology, combined with the actual situation in Sichuan Province, and explored new modes and new formats for high-quality energy development. Zhai Xiu (2019) proposed to strengthen the ability of scientific and technological innovation, enhance the service of ecological civilization and the support of scientific, technological and cultural innovation in education when studying the high-quality construction of ecological security barriers in the northern Inner Mongolia region. These studies mainly focus on the combination of high-quality science and technology supply with current hot industries. Agriculture, as a traditional industry, also needs to explore its high-quality development path combined with science and technology under the background of supply-side structural reform and rural revitalization strategy.

Other scholars analyze it from the perspective of input and output of science and technology. For example, Li Pengfei (2019) analyzed the current situation of Yunnan's scientific and technological innovation from four aspects of scientific research input, scientific and technological output,

achievement transformation and innovation environment, and evaluated the spillover effect of scientific and technological innovation on Yunnan's high-quality economic growth based on the classical economic growth model. Ma Ru et al. (2019) have tested the effect of scientific and technological talents on the growth of total factor productivity, and found that scientific and technological talents are continuously expanding, but their proportion in human capital is low and the development among regions is uneven. Cheng Meilin and Zhang Runlei (2019) used DEA-Tobit two-step method to analyze the allocation of scientific and technological innovation resources in southern Jiangsu. They selected the data of scientific and technological input and output of five cities in southern Jiangsu in 2018, comprehensively evaluated the allocation efficiency of scientific and technological resources, and put forward countermeasures for the high-quality economic development of the five cities in southern Jiangsu.

Through the analysis and induction of the above documents, we can see that experts and scholars are more and more concerned about the research on high-quality supply of science and technology. There are altogether 18 cities in Henan Province, and the rural economic development varies greatly between cities. The results and countermeasures obtained from the general analysis at the provincial level are not reasonable enough, and it is difficult to meet the country's demand for high-quality rural economic development under the background of rural revitalization. As a major agricultural province, Henan plays an important role in the development of rural economy. Pan Xiaodong (2019) thinks that Henan Province, as the “granary of the Central Plains”, should make full use of the “science and technology” brand and change from a “big grain-producing province” to a “strong agricultural science and technology province”. This requires that “science and technology to promote agriculture” must be put at the top of the list, especially how to realize “science and technology to promote agriculture” under the background of “the transformation of rural economy from high growth to high-quality development”, and the research on boosting the high-quality development of rural economy will surely become the object of long-term attention in academia.

3. Development Status

Through literature reading, data collection and on-the-spot interviews, the present situation of science and technology promoting agriculture in Henan Province was investigated. At present, under the influence of traditional agricultural concepts and development models, most areas in Henan Province still suffer from low comprehensive agricultural benefits, weak competitiveness, imperfect agricultural industry system, production system and management system, underdeveloped new agricultural management bodies, and unresolved conflicts between small production and large market.

The main problems between the supply of science and technology and the development of rural economy are as follows: (1) The supply mechanism of science and technology is obviously restricted and the market function is not fully played. The government pays more attention to increasing investment in science and technology and technology supply, but pays less attention to the cultivation of new technologies, new products and new markets. (2) The overall efficiency of the agricultural innovation system is not high and there is no coordination within the system. It is mainly manifested in the dislocation of functions, lack of continuity of coordination, and insufficient dynamic complementary ability among the multiple subjects of government, industry, research and research, which restrict the improvement of coordination and supply efficiency. (3) The success rate of technology supply and demand docking is low, and the precision line of docking needs to be further improved. (4) The input of agricultural science and technology supply factors is insufficient, and the construction of supply and demand platform is weak. Taking the supply of scientific and technological human resources as an example, Henan province has insufficient reserves of scientific and technological talents. (5) The innovative ability of agricultural science and technology supply source is insufficient, and the short board of basic research is prominent. Most of the country's research and development funds are invested in high-end industries and regions with more advanced technology.

4. Analysis on Countermeasures of High Quality Science and Technology Supply in Henan Province to Boost Rural Revitalization

This paper puts forward the countermeasures of Henan province's high-quality science and technology supply to promote the development of villages from the following three aspects.

First, the supply of high-quality scientific and technological systems

A reasonable and effective system is a supporting factor to improve the supply capacity and efficiency of science and technology, and is an important factor that runs through the three supply ends of rural economic innovation source, innovation process and innovation exposition. The Henan provincial government should strengthen top-level design and macro-control and give full play to its planning, control and incentive functions. We will continue to promote the institutionalization and standardization of the input, use and management of scientific and technological funds in rural agricultural economy, further develop the regulatory function of scientific and technological achievements and scientific and technological awards on rural agricultural scientific and technological innovation activities, and improve and strengthen the investment and financing policies for scientific and technological innovation and the implementation of policies for the transformation of scientific and technological achievements.

According to the situation in Henan province, a coordination mechanism with government as the leading factor, enterprises as the main body, universities and other scientific research institutions as well as unemployed intermediary institutions as the coordinating role in science and technology investment will be formed, and a multi-party participation and joint support will be formed. In the implementation of the policy of financial science and technology investment management, we should not only implement the mechanism of stable growth of financial science and technology investment, but also establish the target of government science and technology investment through legislation, and ensure the realization of the target by establishing relevant mechanisms and measures such as target implementation and accountability, so as to ensure the scientific and reasonable allocation and use of funds. Comprehensive consideration of the long-term comprehensive benefits of high-quality science and technology supply in Henan rural economy.

Second, the supply of high-quality scientific and technological resources

Reasonable distribution of scientific and technological resources is a guarantee factor to improve the supply capacity and efficiency of science and technology. The innovative allocation of scientific and technological resources is the foundation for the production of all scientific and technological innovation achievements and the improvement of the country's comprehensive innovation capability. The distribution of scientific and technological resources in Henan Province is uneven and decentralized, the main function of allocation is misplaced, and the allocation mechanism is not perfect. In order to further improve the supply capacity and efficiency of science and technology, scientific and reasonable allocation of scientific and technological resources in China is especially important. The allocation of scientific and technological resources not only depends on the amount of stock of scientific and technological resources, but also is influenced by the structural allocation of scientific and technological resources. Only when resources are effectively shared among organizational regions can the maximum benefits of resources be brought into play.

On the one hand, it is necessary to strengthen the construction of innovation environment and conditions in rural areas of Henan Province and build an innovation resource platform. In order to improve the level and ability of scientific and technological resources allocation in rural areas as a whole, it is necessary to optimize the allocation environment in rural areas of Henan Province, give full play to the effects of resource agglomeration and spillover, promote the mobility of resources, and realize coordinated innovation in rural areas of Henan Province. On the other hand, it focuses on establishing and perfecting the resource allocation model of the combination of production, teaching and research under the guidance of the government, so as to effectively avoid the risks caused by information asymmetry. At the same time, in order to increase the supply of scientific and technological talents in scientific and technological resources, the main body of all kinds of innovation activities should form a system for the growth and cultivation of scientific and technological talents from the aspects of scientific and technological talents selection, use of

scientific and technological talents, management of scientific and technological talents, and service of scientific and technological talents, so that scientific and technological talents can play a role in the high-quality development of rural economy in the new era.

Third, the supply of high-quality scientific and technological services

Adequate and effective scientific and technological services are essential elements to enhance scientific and technological innovation capability and efficiency. On the one hand, perfect government public service is an important part of effective supply. Governments at all levels should continuously innovate public science and technology service modes and enlarge the ability of fiscal and taxation policy tools to participate in public science and technology service. On the other hand, to enhance the effective capability of Chinese science and technology supply, it is more important to provide science and technology intermediary services. Science and technology intermediary is an organization specialized in serving the transformation of scientific and technological achievements and enterprise innovation. The transformation rate of scientific and technological achievements in China is relatively low. One of the important reasons is that the service system of science and technology intermediary is not perfect and its function is not perfect. Science and technology intermediary capacity cannot meet the growing demand for services.

5. Conclusion

Therefore, the competent department of science and technology should perfect the science and technology service system and promote the effective connection between the science and technology intermediary resources and the rural agricultural economy in Henan province. At the same time, do a good job in the planning and macro-control of the science and technology intermediary industry, carry out unified planning and guidance for the development of the science and technology intermediary industry, so as to adapt the development of science and technology intermediary to the market scale, market structure and industrial structure, build a basic platform for the development of science and technology, and improve science and technology policies. Finally, we should perfect laws and regulations, clarify the rights and obligations of science and technology intermediaries, create a fair competition market environment, and ensure that science and technology intermediaries can better carry out rural agricultural economy-related businesses.

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