

# Implications of the Development of Agricultural Research Institutes from the Perspective of New Quality Productive Forces

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**Abstract** Combining with the important exposition of general secretary Xi Jinping on the development of new quality productive forces, this paper discusses the connotation and development requirements of new quality productive forces in agriculture, and reveals the relationship between the development of new quality productive forces and the professional work of scientific research institutes. On this basis, some policy recommendations are put forward for agricultural research institutes to develop new quality productive forces.

**Key words** New quality productive forces, Agriculture, Scientific research institutes

## 1 Introduction

At the Third Plenary Session of the 20<sup>th</sup> Central Committee of the Communist Party of China, it was emphasized to "adhere to the priority development of agriculture and rural areas", "build a long-term mechanism for comprehensive rural revitalization", and "improve the support system for strengthening agriculture and benefiting farmers and helping farmers to get rich". The No. 1 central document in 2024 also proposed that the supporting role of agricultural science and technology needs to be strengthened. On January 31, 2024, General Secretary Xi Jinping pointed out at the 11<sup>th</sup> collective study of the Political Bureau of the CPC Central Committee that "the development of new quality productive forces is an internal demand and key focus for achieving high-quality development, and it is necessary to continue to deepen innovation and promote the rapid development of new quality productive forces"<sup>[1]</sup>. In this study, we deeply discussed the core connotation and development requirements of agricultural new quality productive forces, and clarified the relationship between the development of agricultural new quality productive forces and the business activities of agricultural research institutes. Finally, we came up with some policy recommendations for agricultural research institutes to develop new quality productive forces.

## 2 Understanding of new quality productive forces in agriculture

As the core driving force of high-quality agricultural development, new quality productive force is the inherent requirement and important focus of promoting high-quality development<sup>[2]</sup>. Its connotation includes the optimal allocation of traditional production factors, and the comprehensive application and innovation of new technologies, new models, new formats and other factors. To accelerate the development of new quality productive forces in agri-

culture, we must focus on solving the structural contradictions on the supply side of agriculture, break through the traditional mode of agricultural production that only focuses on output and efficiency, and pay more attention to the improvement of quality, sustainability and resource utilization efficiency.

### 2.1 Relationship between agricultural scientific and technological innovation and agricultural new quality productive forces

Scientific and technological innovation is the strategic support for the development of new quality productive forces in agriculture. Scientific and technological innovation, as the core element of productivity development and transformation, is characterized by subversive innovation, which plays a decisive role in improving agricultural production efficiency. Facing the new round of agricultural technology revolution, we should constantly promote the emergence of agricultural high-tech and seize the frontier of agricultural science and technology. In the development of agricultural three-dimensional space, scientific and technological innovation needs to shift from focusing mainly on the production of agricultural products in the field of traditional cultivated land to focusing on the supply of food in the whole land space of non-traditional cultivated land, breaking through the limitations of natural conditions such as cultivated land and opening up new development space for agriculture in addition to the traditional agricultural field relying on cultivated land. In biotechnology, it is necessary to promote the original breakthrough of seed "chip" technology, accelerate the industrial application of self-developed biological breeding achievements, and ensure the source safety of national food.

### 2.2 Relationship between agricultural green production and agricultural new quality productive forces

Green production is the proper meaning of the development of new quality productive forces in agriculture. It is necessary to adhere to the harmonious coexistence of man and nature, and put the concept of green development throughout the whole process of agricultural modernization. Promoting the formation of green production mode, making good ecological advantages a strong support for agricultural mod-

ernization, and enhancing the agricultural ecological value contained in green mountains and rivers are the inevitable requirements for the development of agricultural new quality productive forces. We should focus on the application of low-carbon and energy-saving agricultural production technology, promote the recycling of agricultural production resources, and realize the ecological efficiency and sustainability of agricultural production. In addition, it is necessary to promote the extensive use of bio-organic fertilizer, as well as the development and utilization of straw returning and biomass energy, so as to continuously improve soil fertility and the taste and nutritional value of agricultural products, and promote the harmonious coexistence of ecology and agricultural production.

### 2.3 Relationship between integration of agricultural industry chain and new quality productive forces of agriculture

Industrial chain integration is a key link in the development of new quality productive forces in agriculture. Industrial chain integration is not simply to increase production or reduce costs, but to improve the comprehensive benefits of agricultural production. Its structural characteristics are the breakthrough of agricultural boundary and the extension of industrial chain, and its core symbol is the overall improvement of total factor productivity of agricultural industrial chain and supply chain. Industrial chain integration promotes new industries, new formats, new models and new services, promotes the effective allocation of resources, and promotes the modernization of agricultural products processing, marketing and logistics, which is the decisive factor for the development of agricultural new quality productive forces<sup>[3]</sup>. Integrating the industrial chain in an all-round way, strengthening the coordinated development of upstream and downstream industries, expanding the boundaries of agricultural development, extending from the primary industry to the secondary and tertiary industries, and enhancing the value of the entire agricultural industry chain are the essentials of industrial chain integration.

### 2.4 Relationship between the cultivation of agricultural talents and the new productive forces in agriculture

Personnel cultivation is the fundamental guarantee for the development of new quality productive forces in agriculture. Science and technology have always been the innovative achievements of innovative talents, and only when they are used by workers with corresponding skills in production, can they be transformed into real productive forces. Therefore, talent is undoubtedly the most active factor in productivity, and also the subjective and decisive factor in the formation of new quality productive forces<sup>[4]</sup>. This necessarily requires the high-quality labor force as the main feature, so that agricultural producers have a higher level of scientific and technological application ability and management level to meet the practical needs of agricultural modernization and provide protection for the development of agricultural new quality productive forces. New quality productive forces needs new talents, through the provision of perfect education and cultivation mechanism and practical opportunities, we can improve a set of agricultural personnel training system and knowledge training system covering R&D personnel,

agricultural technology extension personnel and agricultural practitioners, to take the actual needs as the guide, and to promote the development of agricultural talents, and to cultivate agricultural talents with modern agricultural concepts and innovative spirit. We should aim at new formats, keep a close eye on the frontier science and technology, vigorously cultivate high-quality innovative leaders with original spirit, and shape the main elements of new quality productive forces in agriculture.

### 2.5 Relationship between agricultural system reform and agricultural new quality productive forces

Institutional reform is an inevitable requirement for the development of new quality productive forces in agriculture. The development and reform of productive forces will inevitably lead to changes in the system of production relations. For one thing, agricultural new quality productive forces have a decisive influence on institutional innovation and determine the direction of institutional innovation; every change of agricultural new quality productive forces will put forward corresponding objective demand for agricultural institutional innovation. For another thing, institutional innovation needs to constantly meet the needs of agricultural new quality productive forces, otherwise it will hinder the development of agricultural new quality productive forces. Therefore, we must take the new quality productive forces as the guide to optimize the strategic layout of agricultural scientific and technological innovation.

## 3 Recommendations for the development of agricultural institutes from the perspective of new quality productive forces

### 3.1 Promoting the green transformation of agriculture

The new quality productive forces itself is a green productive force, and the development of new quality productive forces can highlight the high-quality development background of green development<sup>[5]</sup>. For the green transformation, mode should take first. It is recommended to create a new mode of green planting and breeding cycle according to local conditions, such as fruit tree + *Polygonatum sibiricum* planting. In terms of source reduction, the "zero growth" action of pesticide and chemical fertilizer reduction should be strengthened, and the use of illegal drugs should be severely cracked down. In terms of full utilization, the use of feces resources should be strengthened, and the biological composting technology should be deeply excavated to promote the transformation of livestock and poultry feces into "waste". In terms of end treatment, the number of agricultural waste packaging and recycling points should be increased, and the support for research and development and promotion of degradable agricultural film should be strengthened.

### 3.2 Strengthening agricultural scientific and technological innovation

It is necessary to strengthen the research of "seed chip", ensure the autonomy and controllability of provenance, and use advanced technologies such as intelligent seed selection, generative artificial intelligence and gene editing to further promote the core technology of provenance and solve the bottleneck problem of in agriculture. It is recommended to focus on the develop-

ment needs of characteristic and advantageous industries, create a platform for scientific and technological innovation, promote the improvement of fruit quality and ensure quality. In addition, it is necessary to strengthen the transformation and promotion of scientific and technological achievements, speed up the transformation of germplasm achievements from laboratory to field, seize the opportunity of agricultural products exhibition, accurately promote high-quality agricultural scientific and technological achievements, and further enhance the influence of fruit tree research institute.

**3.3 Improving the level of agricultural intelligence** It is recommended to grasp the development opportunities of digital economy, explore the application scenarios of characteristic agriculture, and give full play to the multiplier effect of data elements. It is necessary to promote the digital transformation of agricultural production. For one thing, we should increase the application of intelligent agricultural machinery such as intelligent sensors, intelligent irrigation systems and UAVs to improve the efficiency of agricultural production. For another thing, it is necessary to build an agricultural production data platform and combine it with the agricultural market economy data platform to release the value potential of agricultural production data elements and promote agricultural production to be more accurate, flexible and intelligent. In addition, it is necessary to strengthen support for research and development of intelligent fruit picking equipment, and enhance the intelligent level of the whole process of agricultural products from seed research and development, cultivation and planting, production management and mature picking.

**3.4 Promoting multi-dimensional integration and development of agriculture** It is recommended to actively explore the "agriculture plus" model and give full play to the linkage effect between industries. Based on the characteristics of its own resources, further expand the "agriculture + tourism" model, through the creation of agricultural ecological industrial park, develop tourism, increase the utility of Chinese herbal medicine, and develop health tourism. Besides, we should explore new ways of farming experience such as terrace farming and characteristic picking, and develop experience tourism; speed up the construction of agricultural science and technology parks and enhance the level of openness, and develop research tourism. In addition, we should further expand the mode of "agriculture + cultural creative products", use cultural creative thinking, integrate agricultural elements, innovate the packaging of agricultural products, and enhance the added value of agricultural products. It is recommended to continue to promote the integration of agriculture, culture and tourism, promote the formation of pastoral complexes, and give full play to the value of agriculture.

## 4 Conclusions

Xi Jinping emphasized that in the new era and new journey, it is necessary to adhere to and strengthen the overall leadership of the Party and the centralized and unified leadership of the Party Central Committee, deeply understand and grasp the theme, major

principles, major measures and fundamental guarantees for further deepening reform in an all-round way, and take the lead and set an example in further deepening reform in an all-round way and promoting Chinese-style modernization. The new quality productive forces are the core driving force for the high-quality development of agriculture, including the optimization of traditional production factors, the application of new technologies and innovative modes, which need to focus on quality, sustainability and resource utilization efficiency. Scientific and technological innovation is the strategic support for the development of new quality productive forces. It is necessary to promote the development of agricultural high-tech and realize the three-dimensional development of agriculture and the breakthrough of biotechnology. Green production is an inevitable requirement for the development of new quality productive forces. It is necessary to promote green production mode and promote the harmonious coexistence of ecology and agricultural production. Industrial chain integration is the key to the development of new quality productive forces, which needs to break through the agricultural boundary, extend the industrial chain, and promote the effective allocation of resources and the modernization of the industrial chain. Personnel cultivation is the fundamental guarantee for the development of new quality productive forces, so it is necessary to improve the agricultural personnel training system and cultivate talents with modern agricultural concepts and innovative spirit. Institutional reform is the inherent requirement of the development of new quality productive forces, and it is necessary to optimize the strategic layout of agricultural scientific and technological innovation to meet the needs of the change of new quality productive forces.

Agricultural research institutes should comprehensively and profoundly understand the spirit of the Third Plenary Session of the 20<sup>th</sup> CPC Central Committee on agricultural and rural development and rural revitalization, and General Secretary Xi Jinping on the development of new quality productive forces, and clarify the relationship between agricultural new quality productive forces and the business activities of agricultural research institutes, so as to promote the healthy and rapid development of all work of agricultural research institutes.

## References

- [1] JIANG CY. Connotation, development requirements and development priorities of new quality productive forces[J]. West Forum, 2024, 2: 9 – 21. (in Chinese).
- [2] The development of new quality productive forces in Xi Jinping is an intrinsic requirement and an important focus for promoting high-quality development[J]. Seeking the Truth, 2024: 11. (in Chinese).
- [3] CHEN WS. What are the new quality productive forces of agriculture? How to develop[J]. Rural Discovery in China, 2024, 2: 91 – 95. (in Chinese).
- [4] WU J, FENG DG. Speeding up the formation of talent-driven strategy for new quality productive forces[J]. Contemporary Economic Research, 2024, 9: 52 – 59. (in Chinese).
- [5] ZHOU W, ZHANG YH. New quality productive forces and high quality development: internal connection and key breakthrough[J]. Academic Research, 2024, 6: 73 – 82. (in Chinese).