

# *Influence of Rural Infrastructure Construction on Agricultural Total Factor Productivity*

Shanshan Nie

*Qinghai University, Xining city, Qinghai Province 810000*

1976134188@qq.com

**Keywords:** Rural infrastructure, Agricultural total factor productivity, Influencing mechanism, Suggestions

**Abstract:** Based on the current strategic background of rural revitalization, it is essential to solve the problems of agriculture, rural areas, and farmers and resolve the contradiction of urban-rural dual development. The solution to these problems is agricultural production. In agricultural production, infrastructure construction is also an important influencing factor, which can directly promote economic growth and indirectly promote economic growth under scale effect and network effect, and improve agricultural total factor productivity. The specific mechanism is that agricultural infrastructure increases factor input, the improvement of factor productivity, and the innovation of factor. This work mainly explained the role mechanism to explore further the impact of rural infrastructure construction on agricultural total factor productivity, and think about the way out of agricultural infrastructure construction based on the effects, so as to make suggestions for agricultural infrastructure construction and bring about the steady improvement of agricultural total factor productivity. It will bring about an effective solution to the problems of agriculture, rural areas, farmers, and the dual development of urban and rural areas and truly achieve the development vision of rural revitalization.

## **1. Introduction**

At present, China has increased the support for the development of agriculture, rural areas, and farmers and actively promoted the modernization and informatization construction of agriculture to realize the stable and efficient development of rural economy, which naturally corresponds to the improvement of agricultural total factor productivity. In the development of agriculture, it is necessary to focus on the construction of infrastructure, fully realize the impact of infrastructure on agricultural development, and improve agricultural production conditions and efficiency with the advancement of infrastructure construction to achieve stable growth of the rural economy. At present, China is in the critical period of constructing a well-off society, and the positive role of infrastructure construction in rural economic growth is also undeniable. Since China is a leading agricultural country, it is urgent to strengthen infrastructure construction, improve the total agricultural factor productivity, and take the road of efficient agricultural development.

## **2. The Effect Mechanism of Rural Infrastructure on Agricultural Total Factor Productivity**

### **2.1 Rural infrastructure can promote the input of production factors**

Capital, labor, and resources are the three most important factors of production. Rural infrastructure can affect the growth of agricultural total factor productivity by promoting capital input, labor input, and resource input.

It is necessary to promote capital investment. Infrastructure has the characteristics of a long construction cycle, large construction projects, and high construction costs, so the government must lead the investment in rural infrastructure construction. Some infrastructure, such as rural hydropower and rural roads, has a long construction cycle. The machinery, plant, and power required in the construction process need massive capital input to support. Therefore, the process of rural infrastructure construction can virtually attract many government financial funds and social capital investment, thus promoting the development of the economic economy.

It is necessary to promote labor force input. Since rural infrastructure construction projects are generally relatively large with long construction periods and heavy labor, and most of them are labor-intensive projects, a large amount of labor input is needed in the construction process. Such a great demand for labor force is reflected in infrastructure construction and requires much professional management and maintenance personnel after the completion of infrastructure construction due to China's diverse terrain and scattered rural distribution, making it challenging to manage and maintain. As an essential factor of production, labor is more important in rural areas with an underdeveloped market degree and relatively backward technical level. The great demand for work can create many employment and income opportunities, which will inevitably increase workers' income, enhance the consumption capacity of the whole society, and then promote the development of the rural economy.

It is necessary to promote resource input. Most construction of infrastructure is relatively dependent on resources. For example, irrigation, water conservancy, and rural electric power rely heavily on natural resources such as water, coal, wind energy, and solar resources. For another example, the development of rural education is inseparable from professional teachers, and modern agriculture is inseparable from experts and scholars. The investment of resources has provided support for economic growth and offered dynamic support for agriculture's sustainable and stable development.

### **2.2 Rural infrastructure can improve factor productivity**

In the early stage of rural economic development, the focus of infrastructure construction is mainly to increase the quantity because the productivity of the whole society is very low to meet the needs of primary farmers' life and agricultural production. With the continuous development of the rural economy and the continuous improvement of infrastructure, the infrastructure construction has gradually changed from "quantity" to "quality", such as implementing water-saving irrigation facilities and promoting modern agricultural machinery. It is necessary to implement agricultural infrastructure renovation projects, upgrade and transform power supply lines to prevent power outages. With the gradual transformation and improvement of water conservancy, power grid, and roads, many farmers have increased the planting scale. The overall development towards industrialization and scale has improved the efficiency of agricultural planting. Agricultural economic benefits have been steadily enhanced. In mechanized agricultural production, with the continuous development of rural energy supply infrastructure, all kinds of large machinery can play a role in the fields, significantly improving the agricultural production efficiency.

## **2.3 Rural infrastructure can promote factor innovation**

The innovation of rural infrastructure is mainly reflected in the modernization and intelligence of infrastructure. In the era of overwhelming information technology, the development of intelligent infrastructure has become an irresistible trend. The result of Internet facilities strengthens the exchange between agricultural production and information interaction. For one thing, it can promote the circulation of farm products and solve the problem of agricultural sales; for another, it can also solve the problem of labor surplus in rural areas, strengthen the communication between urban and rural areas, as well as villages and villages, so as to promote the reasonable allocation of resources. The modernization and intelligentization of rural infrastructure have, on the one hand, reduced the excessive dependence of agricultural production on rural labor, liberated productive forces, and increased farmers' income; on the other hand, the modern rural infrastructure promotes agricultural production personnel to become innovative talents and constantly improve their innovation ability. The improvement of their innovation ability, in turn, can encourage the innovation of infrastructure, effectively promote technological progress and innovation, and stimulate economic growth.

## **3. Suggestions on Agricultural Infrastructure Construction Under the Influencing Mechanism**

### **3.1 Increase investment and support in infrastructure construction**

At the present stage, due to insufficient investment in rural infrastructure and poor financing channels, rural infrastructure construction is still relatively weak, and the comprehensive level is not high. Therefore, it is necessary to give full play to the government's guiding role and increase the investment in rural infrastructure. In addition to the direct acquisition of government monetary funds, the support methods of government investment can also be innovated, such as agricultural subsidies, financial discount interest, and the increase of agricultural credit funds to support the construction of rural infrastructure. Additionally, the government can also establish a cooperation mechanism for social capital to guide social capital investment in rural infrastructure.

### **3.2 Improve the management mechanism of rural infrastructure**

Rural infrastructure is a long-term project, and its daily management and maintenance work plays a vital role in ensuring long-term operation. First, in terms of irrigation and water conservancy, it should not only pay attention to water conservancy project construction, but should also pay attention to the coverage of irrigation area and the improvement of irrigation efficiency and water resources conservation, so as to promote the construction of farmland water-saving project, speed up the reform of water conservancy technology, strengthen the construction of hydropower stations run by townships and villages, and strengthen the control ability of water resources. Second, it is necessary to implement the "integration of construction and maintenance" mode in terms of rural roads. For one thing, it should increase the capital investment in rural roads, improve the traffic conditions in remote rural areas, ensure the full coverage of rural roads, and truly achieve "reaching all villages"; for another, it is also necessary to strengthen the maintenance of rural roads, and speed up the quality upgrading of rural roads. Third, in terms of rural electric power, it is necessary to increase investment and construction in new energy construction. On the premise of realizing "reaching all villages", it is required to gradually reduce the use of coal, vigorously develop clean energy, optimize the energy structure, and make it greener and low-carbon. The construction of new energy infrastructure should be vigorously promoted, such as biogas and natural gas, the development and utilization of wind and solar energy should be increased. The transformation and upgrading of rural power grids should be accelerated, so that rural residents can "use electricity" to "make good use of electricity" and to "use

good electricity". Fourth, in terms of rural education, the investment in education should be increased, which should not only pay attention to the cultivation of educational concepts and the construction of teachers, but should also develop the relevant hardware facilities, including the construction of teaching places and the improvement of teaching equipment. It is necessary to strengthen quality education on the labor force in rural areas, cultivate specialized talents in agricultural production, carry out targeted education and training in the face of the labor force directly participating in agricultural production, cultivate new professional farmers, improve the utilization rate of agricultural science and technology facilities and promote the transformation of agricultural scientific research achievements.

### 3.3 Accelerate the reform of modern agricultural technology

Technological progress is the main reason to promote rural economic development. The traditional mode of agricultural production needs to inject fresh vitality and reform emerging technologies, and agricultural modernization is imperative. For one thing, it is necessary to strengthen the transformation of farmers' consciousness. Through skill education and training, farmers can spontaneously promote agricultural modernization and use agricultural modernization equipment to carry out agricultural production; for another, the government should actively encourage and support agricultural technology innovation, carry out the transformation and upgrading of agricultural infrastructure, give full play to the critical role of science and technology in agricultural production, improve agricultural production efficiency, and establish efficient substitute agriculture.

## 4. Summary

In order to achieve the real development of agriculture and truly achieve the ideal goal of new rural construction, it is necessary to pay attention to infrastructure construction and realize the relationship between infrastructure construction and total factor productivity. Based on exploring the influencing mechanism of agricultural infrastructure construction on agricultural total factor productivity, it is necessary to pay attention to infrastructure construction, increase investment, increase technological reform, strengthen essential management, and take multiple measures to bring about steady improvement of rural total factor productivity.

## References

- [1] Adepoju, A. A., & Salman, K. K. (2013). *Increasing agricultural productivity through rural infrastructure: Evidence from Oyo and Osun states, Nigeria. International Journal of Applied Agriculture and Apiculture Research*, 9(1-2), 1-10.
- [2] Kumar, P., Kumar, A., & Mittal, S. (2004). *Total factor productivity of crop sector in the Indo-Gangetic Plain of India: Sustainability issues revisited. Indian Economic Review*, 169-201.
- [3] Weiping, C. H. E. N., & Ying, D. I. N. G. (2007). *Total Factor Productivity in Chinese agriculture: The role of infrastructure. Frontiers of Economics in China*, 2(2), 212-223.
- [4] Obayelu, A. E., Olarewaju, T. O., & Oyelami, N. L. (2014). *Effect of rural infrastructure on profitability and productivity of cassava-based farms in Odogbolu local government area, Ogun state, Nigeria. Journal of Agricultural Sciences, Belgrade*, 59(2), 187-200.
- [5] Neves, M. C., Silva, F. D. F., & Freitas, C. O. (2021). *Agricultural Total Factor Productivity and Road Infrastructure in South American Countries (No. Technical Note No. IDB-TN-2215)*.
- [6] Conradie, B., Piesse, J., & Thirtle, C. (2009). *District-level total factor productivity in agriculture: Western Cape Province, South Africa, 1952–2002. Agricultural Economics*, 40(3), 265-280.