

# Quantitative Economic Analysis of Agricultural Input and Benefit

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**Abstract:** With the deepening of rural reform and the remarkable enhancement of the vitality of agricultural development, the endogenous power of agriculture has become stronger from input support to scientific and technological innovation, and it has become an inevitable trend to improve the efficiency of agricultural investment. The economic activities of agriculture include many economic variables in the social, ecological and economic fields, that is, the development of agricultural economy is influenced by the natural environment, regional economic conditions and policy intervention. To realize the transformation of agricultural production mode from extensive to intensive, this requires us to pay attention to improving the economic benefits of agricultural inputs. Only in this way can we really promote the sustained, rapid and healthy development of agriculture, a basic industry. With the progress of production technology, the output of land unit input will increase, so that the marginal revenue of the same amount of input will increase with the progress of production technology, and the maximum level of marginal revenue of unit input will also increase.

## 1. Introduction

China is a big agricultural country with a long history, and the importance of agriculture is self-evident. The rapid development of agriculture is an important link to realize a well-off society, and the industrialization of agriculture has become particularly important<sup>[1]</sup>. All kinds of materials and funds invested in agricultural production, at different levels of technology and management, with the gradual increase of input, its output can be shown as increasing, decreasing or unchanged<sup>[2]</sup>. The economic activities of agricultural production include many economic variables in the social, ecological and economic fields, that is, the development of agricultural economy is affected by the natural environment, regional economic conditions and policy intervention<sup>[3]</sup>. It is the material basis for the development of other sectors of the national economy. Only the development of agriculture and rural economy can drive the development of other industries.

To realize the transformation of agricultural production mode from extensive to intensive, this requires us to pay attention to improving the economic benefits of agricultural inputs<sup>[4]</sup>. Only in this way can we really promote the sustained, rapid and healthy development of agriculture, a basic industry. Although the relationship between economic benefits of agricultural production and input is not necessarily a simple linear relationship, the change of input factors will have a certain impact on the benefits of economic activities of agricultural production<sup>[5]</sup>. If we want to better describe the quantitative relationship among these economic variables, we should rely on the characteristics of agricultural production and economic activities and appropriate mathematical models<sup>[6]</sup>. This paper mainly considers the quantitative relationship between input factors and benefits in economic activities of agricultural production. The improvement of farmers' living standard can drive the national consumer market and stimulate the national economic development.

## 2. Analysis of the Present Situation of Agricultural Input

Because of the long agricultural production cycle, there is still a long interval between the harvest of the current year and the production of the next year, and farmers lack the knowledge of commodity production and management. When they got their income that year, they couldn't arrange reproduction funds and consumption funds well. Quite a few farmers often considered

purchasing high-grade daily necessities and expanding their houses first, but rarely considered and retained the funds needed for reproduction. Financial investment in agriculture refers to the financial fund arrangement used by the government for agricultural production and development, and is an important content of government financial expenditure<sup>[7]</sup>. Financial investment in agriculture is to improve people's living standards in rural areas in an all-round way. At present, the living conditions of rural residents in some areas are poor, their income level is low, farmers' own quality needs to be improved, and the agricultural ecological environment is seriously damaged. Therefore, the evaluation should be able to truly and accurately reflect the basic situation of financial investment in agriculture, while highlighting the all-round development of people<sup>[8]</sup>. Industrialization is a complete development idea of market agriculture, a strategic direction towards agricultural modernization, a basic management mode of market agriculture, and an effective way to realize the two fundamental changes of agriculture. The environmental factors that affect the benefit of agricultural investment are shown in Figure 1.

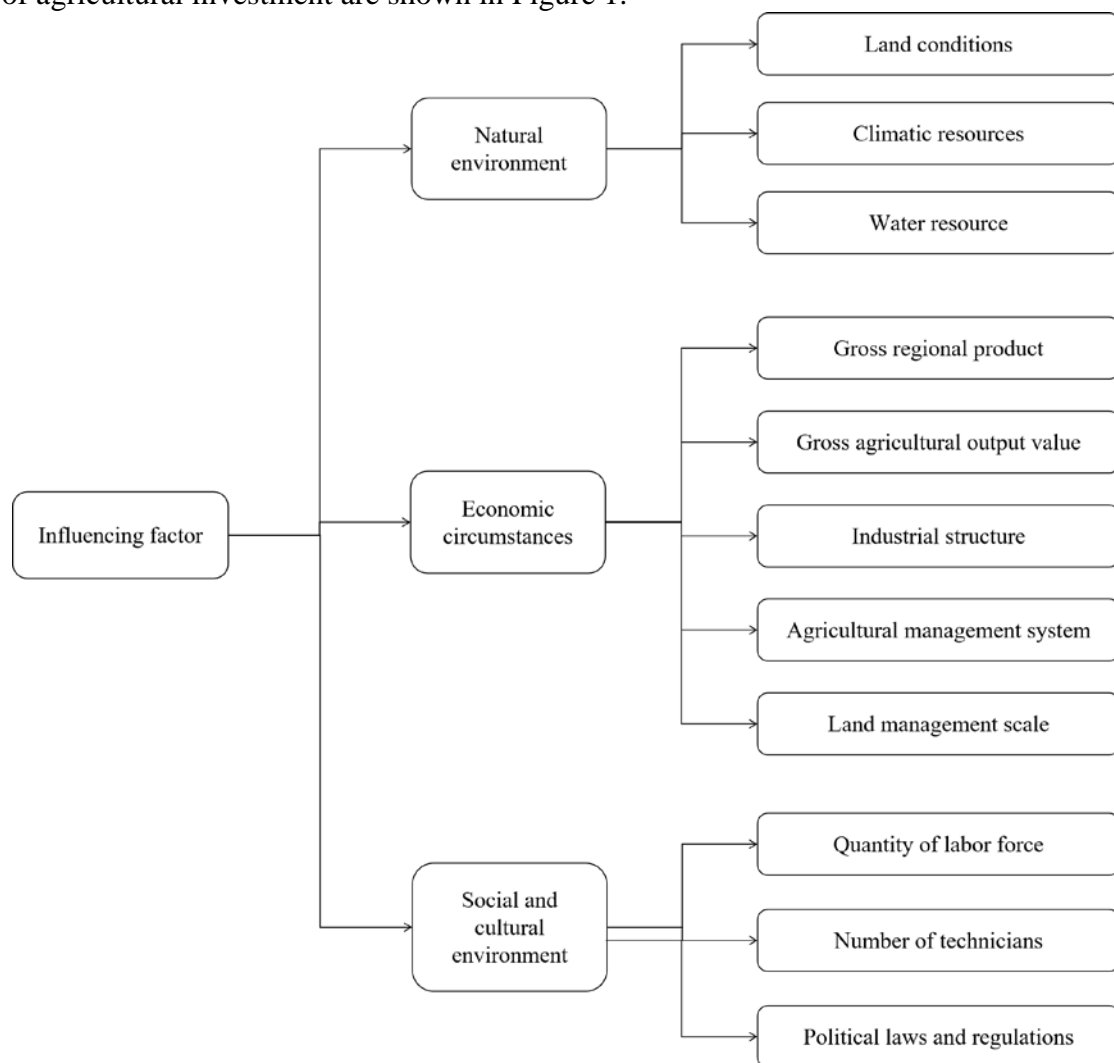


Fig.1 Environmental Factors Affecting the Benefit of Agricultural Investment

The evaluation of the benefit of financial investment in agriculture is a comprehensive evaluation of the benefit of financial investment in agriculture from the aspects of economy, society and ecology with a systematic and comprehensive viewpoint. Under the background of building a new socialist countryside, the overall revitalization and development of agriculture need corresponding construction activities to ensure and capital investment to operate. The production function reflects the dependence between input and output, and its basic form is:

$$y = f(L, K) = AL^\alpha K^\beta \quad (1)$$

In the formula,  $L$  is the labor input,  $K$  is the capital input, and  $y$  is the maximum output

that can be produced by these inputs. Taking the logarithm of both sides of the formula yields:

$$\ln y = \ln A + \alpha \ln L + \beta \ln B \quad (2)$$

Agricultural infrastructure construction is the infrastructure that investors invest in rural areas. Its purpose is to provide services for the production and life in rural areas. It is an important part of agricultural investment, with large investment amount and long payback period, which directly affects the benefit of agricultural investment. Agricultural infrastructure, especially productive infrastructure, has an important impact on agricultural production<sup>[9]</sup>. Although the implementation of the household contract responsibility system has greatly mobilized the enthusiasm of farmers and greatly increased rural investment, at the same time, it has reduced the investment capacity of rural collective economic organizations. Ecology is a vital objective condition for agricultural development, and the deterioration of ecological environment has become an important factor restricting agricultural development and agricultural economic growth. Therefore, we should strengthen the ecological environment construction with afforestation as the main content, vigorously cultivate forest resources, and speed up the comprehensive development and construction of fast-growing and high-yield forest bases and mountain forestry. With the progress of production technology, the output of land unit input will increase, so that the marginal revenue of the same amount of input will increase with the progress of production technology, and the maximum level of marginal revenue of unit input will also increase.

### **3. Countermeasures to Improve the Economic Benefits of Agricultural Inputs**

#### **3.1 Improve the Technical Level of Agricultural Production**

The law of land income decline is based on the premise of the technical level of agricultural production. Agricultural production technology can't change with each passing day like the non-agricultural sector because of its own characteristics of long research cycle<sup>[10]</sup>. Therefore, its improvement will be a slow process. The existence of the law of land revenue passing alkali makes the economic benefit of agricultural input have a critical point. However, this law is based on the premise that the production technology will not change. As long as the agricultural production level is improved, this trend of diminishing marginal revenue can be delayed. With the progress of production technology, the output of land unit input will increase, so that the marginal revenue of the same amount of input will increase with the progress of production technology, and the maximum level of marginal revenue of unit input will also increase. As the basic condition of agricultural development, agricultural infrastructure construction must be guaranteed by funds. Rural infrastructure projects mainly include power grid facilities construction, land protection investment, supporting renovation of large and medium-sized irrigation areas, rural transportation facilities, rural communication, rural drinking water safety, etc. These facilities are mainly to enhance stamina. Their investment scale is small and scattered, so they can make full use of rural surplus labor force, which not only helps to improve agricultural production capacity and comprehensive strength of rural areas, but also helps to increase agricultural income and promote farmers' consumption. For all kinds of public welfare projects, such as ecological construction projects, pest and disease control system, agricultural product safety guarantee system, etc., and we must adhere to the principle of government input at all levels as the leading factor.

#### **3.2 Promote Agricultural Modernization**

Farmers' investment has gradually become the main source of agricultural investment, while farmers' productive investment is influenced by themselves, and the influence of external conditions can not be ignored. In order to solve the unstable situation of farmers, it is necessary not only to increase farmers' wage income, but more importantly, to increase farmers' agricultural income by increasing agricultural investment and improving agricultural production efficiency. Agricultural industrialization is to realize the allocation of agricultural resources and production factors on a larger scale and at a higher level. Its essence is to make agriculture produce the best economic benefits by establishing an agricultural industrial system adapted to the socialist market economy,

and to promote the development of the national economy while the industry develops and farmers become rich. From the future development trend, in order to attract more social capital to invest in agriculture and form a new pattern of diversified and multi-channel agricultural investment, the investment guarantee mechanism, incentive mechanism, subsidy mechanism and risk compensation mechanism of agricultural investment should be further established. To further improve and strengthen the decision-making mechanism of agricultural investment, it is necessary to establish different project analysis methods for different agricultural investment projects to make the project analysis more scientific. At the same time, it is necessary to establish project analysis and decision-making teams to ensure the scientific implementation of the projects.

#### **4. Conclusions**

Agriculture is the key factor to promote the development of national economy. The level of agricultural exhibition in a country or region is closely related to its financial investment in agriculture. The problem of agricultural investment benefit is a complex and long-term problem, and there are many influencing factors. Agricultural infrastructure construction is the infrastructure that investors invest in rural areas. Its purpose is to provide services for the production and life in rural areas. It is an important part of agricultural investment, with large investment amount and long payback period, which directly affects the benefit of agricultural investment. This paper mainly considers the quantitative relationship between input factors and benefits in economic activities of agricultural production. Industrialization of agriculture is to realize the allocation of agricultural resources and production factors on a larger scale and at a higher level. Its essence is to make agriculture produce the best economic benefits by establishing an agricultural industrial system that is compatible with the socialist market economy. The construction of village infrastructure is an indispensable prerequisite for building a new socialist countryside, and it is also a necessary condition for the coordinated development of urban and rural areas and the sustainable development of economy. Good rural infrastructure just happens to be a bridge for urban civilization to extend to the countryside. From the future development trend, in order to attract more social capital to invest in agriculture and form a new pattern of diversified and multi-channel agricultural investment, the investment guarantee mechanism, incentive mechanism, subsidy mechanism and risk compensation mechanism of agricultural investment should be further established.

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