

# The Impact of High Standard Farmland Construction Projects on Soil Slope Stability

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## Abstract

The spatial stability of high standard farmland construction refers to the constancy of the quantity structure and spatial layout of farmland under the influence of natural, social, economic and other comprehensive factors during a certain period of time. The stability of the spatial layout of farmland is a prerequisite for the sustainable use of high standard farmland. However, during the construction process, there is an unscientific selection of high standard farmland. Some of the already built high standard farmland is occupied and ecologically damaged before the comprehensive benefit life of the project, resulting in poor spatial stability of farmland. This goes against the concept of high standard farmland construction and causes waste of construction capital. Therefore, in the current context of sustained and rapid socio-economic development, the construction of high standard farmland not only needs to consider the natural endowments of farmland, but also the stability of its external spatial layout will be the focus of research.

## Keywords

High Standard Farmland; Sudden Governance; Stability; Water Conservancy Facilities.

## 1. Introduction

High standard farmland refers to the construction of concentrated and contiguous areas, supporting facilities, high and stable yields, good ecology, strong disaster resistance, and high standard basic farmland that is compatible with modern agricultural production and management methods within the designated basic farmland protection zone. It belongs to a stable and high-yield grain field that is formed by fields, formed by soil, formed by canals, connected by roads, connected by ditches, fertilized with soil, irrigated with drought energy, drained with waterlogging energy, pollution-free, and high-yield. The construction of high standard farmland can improve the quality of farmland, enhance its disaster resistance and ecosystem service capabilities. Vigorously strengthening the construction of high standard farmland is an effective measure to implement the strategy of "storing grain in the land and storing grain in technology", improve the comprehensive production capacity of grain, and ensure national food security.

## 2. The Problem

### 2.1. Weak Infrastructure

At present, it is located in the parallel ridge valley area of eastern Sichuan, and the special terrain results in the concentration of arable land in mountainous and hilly areas on two or three terraces of stepped low mountains, medium hill valleys, high hills and narrow valleys, monoclinic low mountains, and high mountain platforms. The land is finely scattered, with large slopes and unevenness. The degree of matching of farmland, road network, and channel network is low, and the number of roads is small and the quality is poor, making it difficult to achieve mechanized operations. The aging, disrepair, siltation and blockage of channels,

damage to ponds, and decrease in water storage capacity make it difficult to ensure water supply. The phenomenon of farmers relying on the weather for food is widespread. The weak original field infrastructure and terrain conditions have resulted in a large amount of construction work and many technical difficulties in the current high standard farmland construction. Due to poor terrain conditions, it is difficult to achieve large-scale centralized and contiguous construction in hilly and mountainous areas, and the degree of mechanization is greatly reduced compared to flat dam areas.

## 2.2. Insufficient Funding and Policy Support

According to the current construction standard of 3000 yuan/667 square meters, it can still be completed in plain areas, and there is a large amount of engineering in hilly and mountainous areas. This investment standard is difficult to achieve the expected transformation, or it is difficult to achieve the expected goals after the transformation. At present, the construction of small-scale farmland water conservancy facilities mainly adopts the method of "national investment as the main method, supplemented by local financing". The central and provincial finance pays 1500 yuan per 667m<sup>2</sup>, with the remaining 1500 yuan relying on county-level self financing. Due to weak local financial resources, high investment risks, long term, and low comprehensive investment benefits in farmland water conservancy construction, the overall profitability is not fully determined, and the boundary between government and social capital returns is unclear, Causing difficulty for social capital to actively enter. Since the implementation of the tax and fee reform in 2002, the country's investment in basic construction of farmland water conservancy has significantly decreased. Most of the investment in rural farmland water conservancy construction and facility management is replaced by rewards, resulting in a lack of corresponding funding and policy support for the construction, maintenance, and management of farmland water conservancy projects.

High standard farmland construction projects are arranged according to the principle of "easy first, then difficult". Projects such as land consolidation and hundreds of billions of kilograms of grain have been implemented as early as 2011. In addition, the principle of not allowing duplicate construction in high standard farmland projects makes it more difficult to select the site in the later stage, and the difficulty of rectification increases. In the early stage, the terrain was relatively flat, and the land with abundant water source conditions has been basically renovated. The planned high standard farmland projects are getting farther and farther away from water intake, and the slope of farmland is gradually increasing. The cost of construction materials, equipment procurement, and labor is increasing year by year.

## 2.3. Low Utilization Rate and Inefficient Water-Saving Irrigation

Due to the lack of on-site investigation during engineering planning and design, the rationality of water conservancy engineering design is insufficient. The slope of the water intake basin in mountainous areas is large, the sediment content is high, and the pipeline system is prone to blockage, resulting in the failure of efficient water-saving irrigation technology to achieve the expected results. Many farmers do not have an accurate concept of efficient water-saving projects, nor are they clear about the construction significance of efficient water-saving. Some projects have not been tailored to local conditions in the planning and design stage, and design units have constructed efficient water-saving facilities behind closed doors. At the same time, farmers' planting habits have been fixed for thousands of years, and in contrast, they are more accustomed to adopting traditional irrigation methods, resulting in ineffective efficient water-saving after construction. The proportion of efficient agricultural production is small, and the coverage area is small. Efficient water-saving irrigation in water conservancy projects cannot play a role in increasing production and efficiency, and cannot effectively improve the overall economic situation of the water-saving irrigation project area.

### **3. Countermeasures and Suggestions**

#### **3.1. Strengthen Facility Construction and Build a Solid Foundation for Water Conservancy**

Water conservancy is the lifeblood of agriculture, and the main direction for the construction of high standard farmland is to use water as a platform for farmers to sing opera. Further promote the construction of water conservancy projects, especially a batch of strategically significant projects that benefit the people, and comprehensively coordinate the construction of large and medium-sized water conservancy projects that benefit the people and the country. Make up for the shortcomings of water conservancy infrastructure, with a focus on supporting the construction of canal systems and field projects below the Douqu Canal, increase the strength of canal lining, accelerate the water-saving transformation of the final canal system, and fully tap the potential for grain production in irrigation areas. Conduct a comprehensive assessment of farmland water conservancy facilities, including the construction, operation, and usage of existing water conservancy facilities. Classify and reinforce water conservancy facilities such as dangerous reservoirs, mountain ponds, and weirs that urgently need improvement, and carry out rectification and treatment.

#### **3.2. Increase Government Investment and Broaden Investment Channels**

Increase subsidies for hilly and mountainous areas, enhance the targeted, precise, and inclusive nature of subsidy policies, and increase the proportion of farmland water conservancy facility construction funds in agricultural comprehensive development funds through investment subsidies, rewards instead of subsidies, and financial subsidies. Each county (city, district) should ensure the investment in farmland water conservancy facility construction funds, and ensure project construction funds through a series of financing measures in terms of supporting funds, At the same time, encourage farmers to spontaneously build some small-scale farmland water conservancy facilities. Guide the establishment and improvement of farmland and water conservancy investment and financing platforms, attract and develop more new social entities' capital through various methods such as enterprise loan financing discount, competitive income, and wind direction compensation, explore the establishment of land development funds, the issuance of high standard farmland bonds, and various innovative market investment and financing models such as land PPP, and explore the integration and development with local characteristic industries.

#### **3.3. Promote Water-Saving Development and Strengthen Policy Support**

Develop special subsidy policies for the construction and use of high-efficiency water-saving irrigation equipment in areas with slower economic development, and encourage farmers to promote the use of high-efficiency water-saving farmland irrigation systems. Vigorously develop efficient water-saving irrigation technologies such as pipe irrigation and channel anti-seepage and frost heave prevention, reduce water resource evaporation and leakage, improve water resource transportation efficiency, promote sprinkler and drip irrigation technologies based on planting needs, implement integrated construction of water and fertilizer, and improve water resource utilization efficiency. By constructing efficient and water-saving irrigation projects, improving the development system of efficient and modern agriculture, and gradually achieving the goal of modern agricultural production. Carry out agricultural water-saving actions, adhere to the concept of "land and production determined by water", optimize industrial layout and efficient planting methods, and reasonably use agricultural water. Gradually establish a pricing mechanism for agricultural water use and guide rural areas to transition from traditional irrigation models to efficient water-saving models.

## 4. Concluding Remarks

The construction of high standard farmland is an important measure to implement the principle of "storing grain in the land and storing grain in technology", which is related to national food security. Building a high standard farmland with "drought and flood protection, suitable machine operation" and comprehensive support of farmland, soil, forestry, and electricity technology network is an effective means to achieve the quantity, quality, and ecological protection of farmland, and has very important strategic significance. In the future construction of high standard farmland, not only should we focus on improving quantity and quality, but we should also adjust measures to local conditions, optimize spatial layout, closely integrate with the agricultural industry, absorb various social forces, and maximize the benefits of high standard farmland construction on the basis of increasing public participation.

## References

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