

Thinking of High Standard Farmland Construction Based on Analysis of Cultivated Land Potential

Yidong Zhang

Shaanxi Dijian Guantian Investment Construction Co., Ltd., Baoji, Shaanxi 721000, China

Abstract: Accelerating the construction of high standard farmland is a major decision of the CPC Central Committee and the State Council to strengthen the work of "agriculture, countryside and farmers". In the past two years, accelerating the construction of high standard farmland has been regarded as an important part of strengthening the material support and service system of modern agriculture. It is clearly proposed to make overall arrangements for various construction funds such as land consolidation, reclamation and development, and comprehensive agricultural development, to focus on promoting rural land consolidation, implement comprehensive management of land, water, roads, and forests, and carry out large-scale transformation of medium and low yield farmland to increase the proportion of high standard farmland.

Keywords: High standard farmland, Cultivated land quality, Production potential, Grain production capacity.

1. Introduction

We will actively implement the strategy of storing grain on land, effectively improve farmland infrastructure conditions, and improve the quality of cultivated land. The state will allocate investment to support high standard farmland construction projects within the central budget. High standard farmland construction is to ensure the national food security, promote the development of modern agriculture, accelerate the pace of new rural construction, and steadily improve the comprehensive agricultural production capacity. It is an important strategic measure of the country for agricultural development. China has a large population and little land, and lacks arable land resources. To improve the land output rate, resource utilization rate and labor productivity, we must adhere to the requirements of high quality, efficiency, extroversion, ecology and security, and adhere to arming agriculture with modern equipment, upgrading agriculture with modern science and technology, reforming agriculture with modern management methods, and training farmers with modern knowledge, giving full play to the advantages of science and technology, talent and capital, and vigorously developing efficient agriculture, We should break through the bottleneck of land resource constraints, take the connotative development path of resource intensive, technology intensive and capital intensive, and accelerate the leapfrog development of agriculture.

2. Overview of the Project Area

The project area is located in Linping Town, Qianxian County, with geographic coordinates between $34^{\circ} 19' 36'' - 34^{\circ} 45' 05''$ N and $108^{\circ} 00' 13'' - 108^{\circ} 24' 18''$ E. The project area belongs to the warm temperate continental monsoon semi-arid climate zone. It is dry and cold in winter, hot in summer, mild and humid in autumn, and changeable in spring. There are four distinct seasons in the year. The average annual precipitation is 572mm, the maximum annual precipitation is 887.4mm (1983), the minimum annual precipitation is 264.9mm (1977), and the wet to dry ratio of precipitation is 3.35. The average wind speed in the irrigation period is 1.9m/s, the annual average frost free period is 224

days, the annual sunshine hours are 2194.9h, the maximum frozen soil depth is 0.45m, and the annual average evaporation is 1444.9mm. The landforms in the project area can be divided into four types, namely, wavy loess tableland in the north, eolian proluvial plain in the middle, loess tableland in the south and river terrace area.

3. Field Infrastructure Constraints

According to the land use situation of the project area and the actual situation of the project area, the main limits affecting the development of the project area are obtained the regulatory factors are as follows:

(1) Inadequate irrigation facilities

Most of the existing pump stations in the project area have been unable to work normally, and only when irrigation, villagers spontaneously carry out for rescue maintenance, the pump station often travels on business during irrigation and cannot work normally. The pump station in the project area can reduce the amount of water that can be pumped, As a result, most of the original irrigated farmland in the project area is unable to be irrigated, the irrigated area decreases sharply, and the land productivity down.

(2) Limited irrigation time in the irrigation area leads to limited economic development of planting in the project area the project area has a relatively high geographical position and the irrigation area cannot cover the area. Because most of the special grains are planted for food crops, the water diversion time in the irrigation area is limited, and water shortage occurs during the critical period of crop growth. The original pump well in the project area is located at the groundwater level has dropped and is in disrepair for a long time. At present, some of them cannot operate normally and are in an abandoned state. Supporting water storage is urgently needed for facilities, supplementary irrigation shall be carried out during the irrigation time in non irrigation areas to achieve the purpose of seedling and yield protection.

(3) The road facilities in the field are not perfect and the standard is low

The existing field roads in the project area are basically formed, but the layout of some field roads is unreasonable, and local accessibility conditions poor, the existing roads need to be newly repaired and renovated.

(4) The soil layer in the project area is deep, the ground is flat, the soil plough layer is deep, the texture is good, and most of them are medium soil is suitable for developing agricultural production. According to the soil survey, the average content of soil organic matter in the project area is 0.944%, The content of soil organic matter is low; The average content of total nitrogen is 0.07%, the average content of alkali hydrolyzed nitrogen is 47ppm, and the average content of quick alkali phosphorus is 47ppm the average content is 6ppm, the ratio of nitrogen to phosphorus is 3.3:1, with slight imbalance; Trace Elements Zinc, Boron, Manganese and Iron in Soil. The soil nutrients and the ability to maintain and supply fertilizer are all medium to low. Due to seasonal water shortage the restrictions and low water utilization rate have a slow increase in grain output and cash crops, affecting the economic development of the project area economic stability and sustainable development.

4. Main Construction Contents

4.1. Soil Improvement Project

According to the general survey of soil, the content of soil organic matter in the project area is low, the soil hardening is relatively serious, and the fertility is not high. The average content of soil organic matter is 1.1%, the average content of total nitrogen is 0.0744%, the average content of hydrolyzed nitrogen is 52.9 ppm, the average content of alkali hydrolyzed nitrogen is 47 ppm, the average content of quick alkali phosphorus is 12.6 ppm, the average content of quick available potassium is 170 ppm, and the nitrogen phosphorus ratio is 1.59:1, indicating a slight imbalance; According to the effective content grading standard of soil microelements in Shaanxi Province, most of the cultivated land in the project area is deficient in boron, zinc and iron, while the effective content of copper is relatively rich. The soil nutrients and the ability to maintain and supply fertilizer are lower than the average. This project is designed to apply 31863.92 mu of organic fertilizer, 120kg of organic fertilizer per mu, which is convenient to improve the fertilization efficiency. Organic fertilizer can better improve the soil structure, activate the soil, increase the soil aggregate structure, increase the content of soil organic matter and nutrient elements, and improve the comprehensive soil fertility.

4.2. Irrigation and Drainage Works

The project area is located in the "drought belt". To solve the irrigation problem of food crops in the project area, the first is to solve the water source problem in the project area, and the second is to develop efficient water-saving irrigation, so as to maximize the irrigation benefits of limited water resources. The project area is located in Maomaowan Irrigation Area. There are many pressurized water pumping stations in the original irrigation area in the project area. The water lifting capacity of the existing pump stations in the project area can be restored through the maintenance and reconstruction of the existing pump stations, and field irrigation measures can be taken to achieve irrigation. The groundwater in the project area is deeply buried and scarce. The drinking water for human and livestock is supplied by digging deep wells to extract groundwater for irrigation. The irrigation cost is high. In combination with the actual situation of the project area, this design uses the current irrigation area and the surface water source of the reservoir to restore the pump station on the existing trunk canal, lift water to the

plateau through the pump station, and then lift the water to the high-level pool in each irrigation area, and then carry out water transmission irrigation through the self pressure pipeline through the high-level regulating pool.

4.3. Science and Technology Promotion Measures

After the completion of high standard farmland, carry out farmland quality and fertility grade assessment and dynamic monitoring and evaluation, including farmland infrastructure, convenient farming conditions, land use, production management level, soil organic matter content, soil pH, etc. Carry out performance evaluation of high standard farmland construction, and comprehensively investigate, analyze and evaluate the construction. Implement high standard farmland quality monitoring. Through the analysis of the monitoring results, comparative tests and relevant data of the farmland quality monitoring points, find out the soil fertility of the farmland in the project area, and propose measures and countermeasures to improve the quality of farmland, so as to provide an important basis and guarantee for guiding local agricultural production.

5. Benefit Analysis

The implementation of high standard farmland construction projects can promote social stability and the construction of a new socialist countryside. The implementation of water conservancy and irrigation projects in the project area, on the one hand, can close the relationship between the party and the masses, reduce water disputes caused by irrigation, reduce the economic burden of irrigation, and stabilize social order. Moreover, it will liberate the people in the project area from the heavy field labor, so that they will have more time and energy to invest in other industries, create more labor value, and lay a solid foundation for the people in the project area to get rid of poverty and become rich; On the other hand, after the completion of the project, it can not only irrigate farmland, reduce drought losses, increase agricultural development and farmers' income, but also drive the development of forestry, animal husbandry, sideline and fishery, promote the development of township enterprises, increase employment opportunities for rural labor population, drive rural economic development, and improve people's living standards. The implementation of the pilot project can make the cadres and masses in water shortage areas realize the importance of developing water-saving irrigation, and lay a solid foundation for the promotion and application of water-saving irrigation technology in water shortage areas. The social benefit is temporarily estimated as 500000 yuan.

References

- [1] WANG Jingyi, LI Xiaoming, et al. Research on the change trend of farmland quantity in china for recent 20 years and its driving factors[J].Chinese Journal of Agricultural Resources and Regional Planning,2019,40(8):171-176.
- [2] YANG Jianfeng, MA Juncheng, WANG Lingchao. Evaluation factors for cultivated land grade identification based on multi-spectral remote sensing[J].Transactions of the Chinese Society of Agricultural Engineering,2012, 28(17):230-236.
- [3] ZHOU Xinhua. Effect of slop to terrace projects on soil quality in loess hilly and gully region[J].Yangtze River,2020,51(5):74-78.

- [4] Zhang J H, Su Z A, Liu G C. Effects of terracing and agroforestry on soil and water loss in hilly areas of the Sichuan Basin[J], China. Journal of Mountain Science, 2008,5(3), 241-248.
- [5] LU Yanyan, FAN Lei, LIU Zhen. Cultivated Land Quality Evaluation of Land Consolidation Major Project Based on Land Use Coefficient Correction Method:Major Project of Yanjin County,Henan Province [J]. Areal Research and Development, 2018, 37(5):147-151.
- [6] ZHAO Haile, XU Yan, ZHANG Guoliang, et al. Farmland consolidation zoning based on coupling of improved limiting factors and farmland quality potential[J].Transactions of the Chinese Society of Agricultural Engineering,2020,36(21):272-282+324.