

Influence of High-Standard Farmland Construction on Grain Yield Increase

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Abstract

The Party Central Committee and the State Council attach great importance to the protection of cultivated land and the improvement of soil fertility, and unswervingly do a good job in the construction of high-standard farmland, and improve the construction standard and quality. It is of great significance to increase grain output and improve local comprehensive benefits through high-standard farmland construction. This paper studies and analyzes the high-standard farmland construction projects in the LT area, in order to provide engineering support for similar projects.

Keywords

High-standard Farmland; Project Construction; Grain Production Capacity; Benefit.

1. Introduction

China is a large agricultural country with a large population and relatively insufficient arable land resources. The issue of food security is of paramount importance. Ensuring national food security is an important foundation for maintaining stable and rapid growth of the national economy and social stability. Accelerating the construction of high-standard farmland is of great strategic significance for improving the comprehensive agricultural production capacity, ensuring the national food security and the effective supply of major agricultural products, improving the efficiency of arable land production and water resources utilization, and realizing the sustainable development of my country's agriculture. Ensuring national food security and increasing farmers' income is of great significance for realizing the goal of building a moderately prosperous society in an all-round way, implementing the rural revitalization strategy and promoting rural modernization. As an important measure of financial support for agriculture, high-standard farmland construction plays an important role in promoting the process of rural reform and development.

2. Project Area Overview

Lintong District, subordinate to Xi'an City, Shaanxi Province, is located in the east of Guanzhong Plain, with Lantian County in the south, Yanliang District in the north, Sanyuan County in Xianyang City in the northwest, Gaoling District in the west, Linwei District in Weinan City in the east, and Ba in the southwest. The bridge area is the boundary. It is between 109°05'49"~109°27'50" east longitude and 34°16'49"~34°44'11" north latitude, with a total area of 915 square kilometers. The climate of the project area belongs to the continental warm temperate semi-arid monsoon climate, with distinct seasons of cold, warm, dry and wet. The annual average temperature is 13.5 °C, the extreme minimum temperature is -17 °C, the extreme maximum temperature is 41.9 °C, the maximum permafrost depth is 28cm, and the annual average rainfall is 575.82mm. , the rainfall has a strong seasonality, mostly concentrated in July, August and September. The average annual evaporation is 1035.7mm, the sunshine hours are 2154.7h, the monthly average relative humidity is 68.6%, and the average wind speed is 2.6m/s. The earthquake intensity is VIII degree. The landform characteristics of the project

area belong to the Weibei plain area, with open ground, deep soil layers and fertile soil. The soil characteristics are grayish-yellow, and the main soils are pseudo soil and loess soil. The altitude is about 350-370m above sea level. The local farmers mainly use groundwater for domestic use, and the main form of agricultural irrigation water is the exploitation of shallow phreatic and surface water. At present, the current project area mainly exploits shallow diving, and has not yet exploited deep confined water on a large scale. At present, the yield of farmland is low and unstable, and the cost of cultivation is high, but the potential for land development is great. By investing a certain amount of manpower and material resources in the construction of high-standard farmland, high-yield, high-efficiency and high-standard farmland can be built.

3. The Goal of Building

Build 37,000 mu of high-standard farmland construction projects to further enhance high-quality grain production bases. Comprehensive production capacity. Vigorously promote water-saving projects, reduce channel leakage, improve canal water utilization coefficient, and achieve water-saving and high-efficiency. Reasonable selection of the channel section, reducing the amount of water filling the canal, shortening the water delivery time, reducing the leakage of the canal, and preventing the canal slope from scouring, collapse and deformation.

Scientifically carry out the planning and construction of farmland infrastructure, improve the comprehensive agricultural production capacity through the reasonable arrangement and matching of fields, roads, bridges, canals, stations, anti-seepage canals and other buildings, as well as the laying of field roads, to meet the needs of the development of mechanized operations, for efficient Agricultural development provides a basic guarantee to achieve high and stable yields. Strengthen the supporting structures of the canal system, form a good control, expand the area of artesian irrigation, and improve the irrigation conditions.

Promote low-pressure pipeline irrigation. It is convenient to use and save water. good irrigation water conditions It can not only increase the output, but also have better benefits to improve the quality. Appropriate regulation of scattered strip fields; planting trees and afforestation to form a farmland environment in which fields form squares and forests form a network. Cultivate pillar-type agricultural industries, improve traditional agricultural production methods, and form local specialties.

It will promote the development of related industries, establish a production and marketing model of agricultural leading enterprises + farmers' economic cooperation organizations (associations) + bases + farmers, continue to focus on the production of high-quality wheat and corn as the leading industry, and focus on cultivating related industries. Leading enterprises, forming a pillar-type agricultural industry chain. Give full play to the demonstration and driving function of the project area. With the support of this high-standard farmland project, the project area will be built into a demonstration model of high-standard farmland, which will effectively drive regional economic development and accelerate the pace of high-standard farmland construction.

4. Main Construction Content

Effectively improve 13572.30 mu of soil, increase the application of organic fertilizer, 200kg of fertilizer per mu, the source of organic fertilizer can be composted or decomposed, non-toxic and harmless manure, manure, soil fertilizer, biogas fertilizer, cake fertilizer, organic waste and waste, and commercial organic fertilizers that meet the standards can also be used. To improve soil quality, implement soil improvement engineering measures to further improve soil physical properties, increase soil organic matter content, increase soil fertility, enhance soil resistance to stress, improve arable land fertility conditions and arable land quality grades, and form a good soil ecological environment. The organic matter content of the soil ploughing layer

is increased by more than 0.1%, the fertility of the arable land reaches the level of medium-to-upper or high fertility, the quality of the arable land is improved, the land grade is improved, and the output rate is increased. 30 newly drilled wells and 8 repaired wells. 61.57km of pipelines were laid, 985 water outlet piles were buried, and an irrigation area of 45,635 mu was controlled. 34 new well houses, 23 sets of pumps and electrical equipment, 2 new pumping stations, 2 sets of KQSN/L250-N19 pumps, 14 sets of transformers, a total of 3,350m of 10kV transmission lines, and a total of 5,214m of low-voltage cables buried. 55 field canals were reconstructed, and the length of lining canals was 34.5km, including 2.23km of D60U-type canals and 27.14km of D40U-type canals. There are 87 supporting canal buildings and 31.02km of field roads. Farmland protection measures the farmland protection measures are mainly farmland shelterbelts and street trees. A total of 19,406 street trees and 9,979 farmland shelterbelts are planted. A total of 3,000 people were trained for agricultural technicians

5. Comprehensive Benefit Analysis

5.1. Economic Benefit Analysis

UAfter the project is completed, the newly improved planting area will be 37,000 mu; after the completion of high-standard farmland, the irrigation water utilization coefficient of the project area can reach 0.85, and the irrigation water utilization coefficient of the Xuyang Sub-district Office project area can reach 0.65. Annually, 1.35 million kg of new wheat, 1.35 million kg of corn, 225,000 kg of new fruit, 112,500 kg of cotton, 450,000 kg of autumn miscellaneous crops, and 225,000 kg of new agricultural crops can be added annually. The output value is 9.6188 million yuan, and the sharing benefit of water conservancy irrigation is 3.8475 million yuan.

5.2. Social Benefit Analysis

After the project is completed, it can greatly improve the agricultural production conditions, enhance the comprehensive agricultural production capacity of the project area, and promote and drive the development of grain production and modern agriculture in the county. The rural living environment will further develop the rural economy, make the society more stable, and strengthen the relationship between the party, the masses, the cadres and the masses. In order to further implement the scientific concept of development, promote the increase of farmers' income, and promote the construction of a new socialist countryside, it will have a far-reaching impact.

5.3. Ecological Benefit Analysis

After the project is completed, the goals of smooth and fertile fields, supporting water conservancy facilities, smooth field roads, advanced and applicable technology, high quality, high yield and high efficiency can be achieved, and the microclimate of farmland can be improved. The improvement of farmland water conservancy facilities can improve the land utilization rate and crop multiple cropping index. The multiple cropping index in the project area has been increased from 1.14 before the project implementation to 1.30.

5.4. Increase the Production Capacity and Output Value of Agricultural Products

After the implementation of the project, the planting area will be 37,000 mu, which will greatly promote the improvement of agricultural production conditions in the project area, and lay a solid foundation for the adjustment of the agricultural industry structure, the increase of agricultural production and the increase of farmers' income in the project area. According to the survey data on the increase of crop irrigation per mu in the project area in recent years, the annual increase of wheat is 1.9425 million kg, the annual increase of corn is 1.998 million kg, and the total agricultural output value is 10.4451 million yuan. It has greatly promoted the

development of the rural economy in the project area, and the social benefits are very significant.

References

- [1] YAN Na. High-standard Farmland Water Conservancy Project Benefit Analysis[J]. *Water Resources & South to North Water Diversion*, 2022, 51(2):28-30.
- [2] Liu Zhengmao, Shang Leilei, Ouyang Chang, et al. Index System of Eco-environmental Protection during High-standard Farmland Construction[J]. *Environmental Science and Management*, 2022, 47(4): 149-153.
- [3] WU Hong. Analysis of High-standard Farmland Construction Project in a County in Xinjiang[J]. *Water Resources & South to North Water Diversion*, 2021, 50(2):28-29.
- [4] JIANG Peifu, LIU Qunchuang, BAI Meijia. An Analysis of High-standard Farmland Construction [J]. *China Rural Water and Hydropower*, 2013, (11):175-178.