

The impact of high-standard farmland construction on the improvement of cultivated land quality and benefits

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Abstract

High-standard farmland construction can improve the quality and output of agricultural products, improve economic benefits, and increase farmers' income, which is in line with the development direction and goals of new socialist countryside construction. Under the large-scale management, the destruction of the former cultivated land has been reduced, so as to continuously improve the quality of the cultivated land in the project area and ensure the farmers' high yield and good harvest.

Keywords

High-standard farmland; land consolidation projects; food security; engineering construction.

1. Introduction

The project construction has always adhered to the implementation of the scientific concept of development, with the goal of promoting the continuous increase of agricultural efficiency and farmers' income, strengthening the construction of agricultural infrastructure, improving agricultural production conditions, taking comprehensive measures according to local conditions, carrying out comprehensive construction of fields and waterways, and focusing on building high and stable yields. The high-standard farmland, improve the comprehensive agricultural productivity, and lay a material foundation for the development of modern agriculture and the construction of new countryside; further improve the technological content of project construction, innovate the mechanism, strengthen project and fund management, and strive to improve the construction and management level of high-standard farmland projects. Optimizing resource allocation in accordance with the requirements of public finance, based on the resource advantages and comparative advantages of the project area, and in line with the principles of improving comprehensive grain production capacity, ensuring supply, and leaving room for food, improve grain production capacity and ensure food security.

2. Project area overview

The project area is located in Chengguan Town and Nanzhang Town, Fengxiang District, Baoji City, Shaanxi Province, with a total of 2 towns and 7 administrative villages. The project area is located in the compound part of the Qinling zonal, Qilu Heshan-shaped and Shaanxi scroll tectonic system. The terrain is complex and diverse, with mountains, rivers and plateaus. The general topography in the territory is Beishan, South plateau and Xihe Valley. The northern hilly and mountainous area is 1200-1600m above sea level and the highest peak is 1678m. It is composed of red bottom conglomerate and three-toed horse laterite. The ravines are vertical and horizontal, the streams are gurgling, the sparsely populated area is wide, and it is quiet and elegant; the southern plain is 649-968m above sea level, with a relative height difference of 319m. The project area belongs to the warm temperate continental monsoon climate zone, which is semi-humid and semi-arid. The annual average temperature is 11.4°C, the annual

average temperature of the coldest month is -5°C , the maximum frozen soil depth is 0.26m, the precipitation is 625mm, and the frost-free period is 209 days. There are four distinct seasons throughout the year, with long winters and summers and short springs and autumns; rain and heat are in the same season, which is conducive to the growth of crops. However, during the growing season of crops, the solar radiation is strong, the temperature and precipitation vary greatly from year to year, and droughts are also prone to occur. Due to the influence of topography, the climate difference between the north and south of the project area is quite large. The annual average temperature in the southern plateau is 4.2°C higher than that in the northern mountainous area, the frost-free period is about 20 days longer, and the annual precipitation is about 100mm less. The soil layer in the project area is deep and fertile, and the soil in the area is mostly sandy loam and loess. Sandy loam refers to soil with moderate content of clay, silt and sand in the composition of soil particles, and its sand content can reach 55%-85% between loam and sand. The soil has high nutrient content, loose soil, aeration and water permeability, not sticky or hard, suitable for farming, but poor in fertilizer and water retention. When fertilizing, the principle of eating less and more meals should be used, and the fertilizer should be applied frequently and sparingly to prevent the loss of fertilizer. Loess soil is an agricultural soil that is cultivated and matured on loess-like sediments in different strata—the parent material of loess.

3. Status of the project area

3.1. Status of land leveling

The land leveling works in the project area are distributed in Sanlihe Village, Chengguan Town, with good soil quality, gentle slope, close to the village and convenient transportation. However, the local slope of the field is relatively large and the potholes are uneven, which affects the cultivation.

3.2. Soil Fertility Status

Soil fertility is the foundation of land productivity. According to the soil nutrient test report provided by the Fengxiang District Agricultural Technology Extension Service Center, the soil in the project area is low in organic matter and moderate in nitrogen, phosphorus and potassium. In order to achieve the overall goal of high and stable yield, and to achieve the goal of fertile and leveled land, according to the specifications of high-standard farmland, the soil nutrients of farmland should reach a medium level or above. Therefore, it is necessary to carry out soil testing and fertilization to increase soil nutrient content.

3.3. Status Quo of Irrigation and Drainage Engineering

The existing wells in the project area are 80-200m deep, with an average water output of $32\text{m}^3/\text{h}$. Due to the aging of some motorized wells, there are problems such as no well room, damaged water pump, and imperfect supporting facilities, etc., and the utilization efficiency of the motorized wells is low. Due to the imperfect supporting facilities of the field engineering irrigation facilities in the project area, the crop irrigation guarantee rate is low, and the water demand requirements of the crops in the irrigation area cannot be met. The water conservancy projects in the project area affect the development of agriculture and rural economy, and restrict the development of project benefits. Therefore, it is urgent to renovate the field irrigation facilities in the project area, and consider new drilling wells, matching low-pressure hidden pipes, and improving water conservancy facilities for the fields that are not radiated by the original channels, so as to ensure the safety of grain production in the project area and increase the income of the people.

3.4. Current Situation of Field Road Engineering

The road to the village in the project area has basically been hardened, which is convenient and fast. However, most of the existing field roads are naturally formed by the long-term rolling of agricultural machinery. The roads are narrow, low-lying and uneven, the roadbed and pavement are seriously damaged, overgrown with weeds, and the road facilities in some plots are not perfect. It is difficult for machinery and transportation vehicles to reach the fields. , unable to meet the mechanical operation and traffic requirements, seriously affecting the mechanical operation and agricultural product transportation, restricting the development of efficient agriculture.

4. Main engineering measures

According to the water source, topography and the layout of the existing irrigation system in the project area, the existing water conservancy irrigation and drainage facilities will be repaired and improved, and the water conservancy facilities will be matched to realize the water conservancy of the farmland. This time, newly drilled and repaired wells in the project area lacking water sources, improved supporting buildings and their field power transmission and distribution projects; renovated roads in the project area that could not meet farmers' farming requirements; The land is leveled and bio-organic fertilizer is applied to the cultivated land in the project area.

A total of 22 mu of land is leveled in the project area, and the total area of soil improvement projects in the project area is 25,417 mu, of which 25,417 mu of bio-organic fertilizer is applied, and 25,417 mu of land is rotated. state, organic matter content greater than or equal to 40%, effective viable count greater than or equal to 0.2 billion/g) 100kg, and a total of 3007760kg of bio-organic fertilizer was added. The water source projects in the project area include 22 newly drilled wells, 15 repaired wells, 35 supporting well houses and 23 pumps. The water pipeline engineering in the project area includes 23,532m buried irrigation pipelines, 543 supporting water supply hydrants, 123m pipe jacking, 22 drainage wells, and 23 gate valve wells. The total length is 12595m, of which 5m wide concrete road is 6361m and 4m wide concrete road is 6234m; the total length of field gravel road is 10370m, of which 5m wide gravel road is 353m and 4m wide gravel road is 10017m; farmland power transmission and distribution projects in the project area include Added 31 new transformers, erected 10,870m of high-voltage lines, buried 1,165m of low-voltage cables, 27 metering boxes, and 24 distribution boxes.

5. Benefit Analysis

Through the implementation of high-standard farmland construction projects, the development of agricultural production has been promoted, which has laid a foundation for the development of agriculture-based rural economy and the adjustment of planting structure to develop the economy. Farmland water conservancy facilities have been updated or improved, improving the ability of farmland to withstand droughts and floods, increasing grain yields, changing the rural industrial structure, and adjusting the grain-based agricultural economic structure. The water and soil resources in the project area have been effectively protected and rationally utilized, the land utilization rate and labor productivity have been improved, the population and environmental capacity have been increased, the rural industrial structure has been improved, and the people's living standards have been improved. The implementation of the project will enable farmers in the project area to get rid of poverty and become prosperous; with the improvement of agricultural production level and the increase of farmers' economic income, the food structure of farmers will also change, and the quality of life of farmers will be significantly improved. The implementation of the project has improved the water utilization rate, significantly reduced the irrigation water consumption per unit area and the irrigation

water cost, saving water, labor and time for irrigation. The implementation of the project not only reduces the burden on farmers, but also lays a good foundation for the adjustment of the industrial structure, making the small-scale farmland water conservancy project a driving force for increasing local grain production, and at the same time driving the development of related industries. The implementation of the project has also played a role as a model for the surrounding villages in the project area, and has played a good guiding role in the construction of agricultural development projects in the surrounding areas.

References

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