

The impact of high-standard farmland construction projects on grain production capacity in DL County

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Abstract

The implementation of the high-standard farmland construction project will provide and accumulate experience for the local comprehensive management of fields, water and roads; through land consolidation, the cultivated land in the project area will be concentrated and contiguous, which can lay a good foundation for the construction of high-yield farmland and realize the scale in the future. The modern agricultural management mode of operation and mechanization will greatly increase grain output, reduce agricultural production costs, and provide a significant demonstration role for large-scale agricultural production and operation in other regions. The masses can understand and support the land consolidation work, so as to promote the comprehensive, long-term, in-depth and smooth development of the land consolidation work.

Keywords

High-standard farmland; land engineering; grain production capacity; benefit.

1. Introduction

As the basis of grain production, the quality of farmland not only affects the level of grain output, but also affects the quality of agricultural products and is the foundation of food security. At the same time, farmland is an important part of the ecosystem, and soil is an important carbon pool (carbon sink), which plays an important role in promoting the green and low-carbon development of agriculture and promoting the construction of agricultural and rural ecological civilization. The Party Central Committee and the State Council attach great importance to the protection of cultivated land and the construction of high-standard farmland, and continue to improve the guarantee capacity of grain production. The protection and construction of cultivated land shall be taken as an important content. According to the "Opinions of the General Office of the State Council on Effectively Strengthening the Construction of High-standard Farmland to Improve the National Food Security Guarantee" issued by the State Council, it is pointed out that ensuring the supply of important agricultural products, especially grain, is the primary task of implementing the rural revitalization strategy. Building high-standard farmland is a key measure to consolidate and improve food production capacity and ensure national food security. It is clearly proposed to "unify construction standards, speed up the revision of the general rules for high-standard farmland construction, and study and formulate sub-regional and type-specific standards and quotas for high-standard farmland construction.

2. Project location overview

The project area is affiliated to Weinan City, Shaanxi Province, and is located in the eastern part of the Weibei Plain in Guanzhong, Shaanxi Province, where the Huang, Luo and Wei rivers converge. The Weihe River is adjacent to Tongguan, Huazhou District and Huayin City in the south; the Luohe River is adjacent to Linwei District and Pucheng County in the west; Taiyuan is adjacent to Chengcheng and Heyang County in the north; the Yellow River is adjacent to

Yongji, Shanxi Province in the east. City face each other. It is located between 34°36'~35°02' north latitude and 109°43'~110°19' east longitude. The project area has a semi-humid and semi-arid monsoon climate in the warm temperate zone, with an annual average temperature of 14.4°C, a precipitation of 514mm, and a frost-free period of 214 days. The terrain is flat, the soil is fertile, and the irrigation conditions are excellent. Yuanjing irrigation area covers the whole county, and the effective irrigation area accounts for more than 80% of the total cultivated land. According to the cultivated land quality grade database of Dali County, the current grade of arable land in the project area is mostly grade 11, and the grade of irrigated land is mostly grade 9.

3. Analysis of project construction conditions

3.1. Transportation Facilities

The external traffic conditions in the project area are relatively good, and the transportation is convenient and fast. Village-level hardening is basically the same. The layout of the field road route is unreasonable, the route is curved with the bend, the slope is steep, the curve is sharp, and the road is narrow. The subgrade is a soil structure, and the width of the subgrade varies. Because the subgrade is seriously violated by the water flow, many parts of the subgrade are uneven, and the overall road damage is serious, which is not conducive to the operation of agricultural machinery in the field.

3.2. Status of field irrigation and drainage facilities

The current water source in the project area is relatively sufficient, but the irrigation facilities are not perfect, and there are relatively few irrigation and drainage facilities in the field. Drainage facilities, and some of the channels are damaged and the leakage loss of the soil channel during irrigation is relatively serious, and the water utilization coefficient is low.

3.3. Soil condition

Due to continuous cropping, unreasonable irrigation, heavy application of inorganic fertilizers and other reasons, agricultural production in the project area has caused soil nutrient imbalance, microbial population damage, and pesticide residue enrichment, etc. Increased productivity. During the implementation of the project, the application of bio-organic fertilizers will improve soil conditions and increase the level of land production.

3.4. topographic conditions

Other grasslands in the project area have uneven terrain and uneven ground, which is prone to soil erosion. Water and soil loss in the project area is mainly manifested by hydraulic erosion. In the event of heavy rain during flood season, it will lead to the destruction of fertile fields and the decline of soil fertility, which will affect agricultural production. Through the land leveling project, improve the impact of other grassland terrain on agricultural production in the project area. For a long time, these factors have restricted the improvement of the comprehensive agricultural production capacity of the project area, and also restricted the improvement of the land utilization rate and output rate of the project area, and greatly affected the production enthusiasm of local farmers. It is urgent to solve the obstacle factors through scientific planning and design, and improve the utilization rate and output rate of land in the project area.

4. Analysis of the productivity of arable land

The project is a high-standard farmland construction project, with the goal of building high-standard basic farmland, in accordance with the overall land use planning and land consolidation planning, in key rural land consolidation areas and major projects, basic farmland

protection areas, and basic farmland preparation areas. Land consolidation activities, and through the construction of rural land consolidation and construction of concentrated contiguous land, supporting facilities, high and stable yields, good ecology, and strong disaster resistance, build basic farmland that is compatible with modern agricultural production and management methods. Therefore, through the implementation of the project, the quality of cultivated land has been improved, and the production conditions have been greatly improved, but there is no new source of cultivated land.

5. Project construction content

The construction content of the project mainly includes land leveling engineering, soil improvement engineering, irrigation and drainage engineering, field road engineering and farmland power transmission and distribution engineering. The details are as follows: (1) Land leveling works The area of this land leveling is 1266 mu, the earthwork volume is 440372m³; the topsoil is stripped of 253163 m³; (2) Soil improvement project The soil improvement project is divided into soil ploughing and soil fertilization. The soil ploughing area is 3585 mu, and the organic fertilizer is increased by 358t. (3) Irrigation and drainage works 1 new pump house, 1 new 50m³ regulating pool, 1 100m³ regulating pool, 649m of dn125UPVC pipe, 1023m of dn110UPVC pipe, 1892m of dn90UPVC pipe, 844m of dn75UPVC pipe, 8122m of dn63UPVC pipe, 26 gate valve wells, 15 drain wells, There are 99 water outlet piles; 5858m of new D40U-shaped canals, 1540m of D40U-shaped canals are renovated, 17 diversion gates, 74 diversion outlets and 10 culverts are arranged. (4) Field road engineering New 2m wide plain soil production road 1230m. (4) Ecological restoration project Planted 486 red leaf plums. (5) Farmland power transmission and distribution project Erect 214m of high-voltage lines, 40m of low-voltage lines, and 2 new transformers.

6. Grain Capacity Analysis

The project is carried out in accordance with the "Notice on Doing a Good Job in Newly-Increased Cultivated Land and Increased Production Capacity in the Process of High-standard Farmland Construction" jointly issued by the Shaanxi Provincial Department of Agriculture and Rural Affairs and the Shaanxi Provincial Department of Natural Resources Regional arable land productivity assessment.

The formula for calculating the productivity of cultivated land:

New production capacity = increased production capacity from new cultivated land + increased production capacity from high-standard farmland construction

Increased productivity of newly-added cultivated land = (D - average quality of newly-added cultivated land) × newly-added cultivated land area × 15 × 100

Increased production capacity of high-standard farmland construction = (average quality of cultivated land before high-standard farmland construction - average quality of cultivated land after high-standard farmland construction) × high-standard farmland construction area × 15 × 100

In the formula:

D—the capacity calculation constant, D≤16 (when the capacity is 0, D=16)

15—means 1 hectare = 15 mu

100—represents mu/kg

The average national utilization level of the original cultivated land in the project area is between 7 and 11. After the project is completed, the dry land will become irrigated land, which effectively improves the quality of the cultivated land in the project area. The state utilization

of the original cultivated land is one level higher than before the implementation. , the new grain production capacity was 100 kilograms, and the new grain production capacity was 532t.

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