

Research on the quality assessment of cultivated land based on high-efficiency water-saving irrigation

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Abstract

Cultivated land grade evaluation is a comprehensive evaluation of cultivated land quality, and the results of cultivated land quality classification have important reference significance in various stages of land remediation project implementation. In this paper, the evaluation of cultivated land in LT area is studied, and the evaluation method of cultivated land is described in detail.

Keywords

Water-saving irrigation; cultivated land quality; cultivated land grade; influencing factors.

1. Introduction

The land consolidation project is an effective measure to improve the quality of cultivated land and improve the farming environment through engineering measures. Through the unified planning and reasonable layout of the project area, the area of effective cultivated land can be increased, the quality of cultivated land can be improved, the dynamic balance of the total amount of cultivated land in the region can be achieved, and agricultural production can be enhanced. The development potential will cover the production and living conditions of farmers, increase the economic income of farmers, promote the sustainable development of the agricultural economy, and then provide strong support for solving the "three rural" problems and speeding up the construction of new socialist countryside. The evaluation of the quality of arable land is an evaluation work carried out by the natural resources department according to the quality of the arable land. The better the arable land, the higher the grain production capacity. Therefore, the evaluation of cultivated land based on the purpose of improving grain production capacity is particularly important in the whole land remediation project.

2. Project area overview

The project area is located in LT District, Shaanxi Province. The geographic coordinates are 109°5'49"~109°7'50" east longitude and 34°16'49"~34°44'11" north latitude. 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 between 350 and 370m. 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 annual average 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 total amount of water resources in the project area has averaged 154.3 million m³ for many years, including 40.29 million m³ of surface water

resources, 121.87 million m³ of groundwater resources, and 7.86 million m³ of groundwater and surface water duplication in the whole area.

3. Status of land use in the project area

3.1. The quality of cultivated land in the project area before the implementation of the project

The total cultivated area of the project area is 1040.1163 hectares, all of which are irrigated land. The national natural grades of cultivated land in the project area are 7th and 8th grades, of which 978.9420 hectares of 7th grade land and 61.1920 hectares of 8th grade land. The national utilization level of cultivated land in the project area is grade 7, with a total of 1040.1163 hectares. The national economic level of the cultivated land in the project area is 9, with a total of 1040.1163 hectares.

3.2. Conditions of basic measures in the project area before project implementation

3.2.1. Current status of water conservancy projects

Water source project: There are 11 irrigation wells in the project area. Among them, the supporting wells are not perfect and cannot be used normally, so they cannot give full play to their benefits.

The field works in the project area are mostly earth canals for water delivery, which takes a long time for irrigation and causes large leakage. Secondly, some channels are cultivated and cannot be irrigated. Most villagers use water hoses for irrigation, which is labor-intensive. Without the supporting buildings in the field, the normal use of the channel cannot be met, and the amount of water resources is wasted seriously. The roads in the fields are smooth but narrow, and machinery cannot enter for farming, which affects farmers' enthusiasm for farming.

3.2.2. Agricultural machinery and agricultural machinery service facilities

The street office where the project area is located has an agricultural machinery station with 8 staff, mainly including large and medium-sized tractors, agricultural trucks, irrigation and drainage power machinery, and combine harvesters. To meet the needs of agricultural modernization development in the project area.

3.2.3. Transportation and Electricity

The transportation of the project is very convenient, and the infrastructure such as electricity and communication is developed and complete. The main roads of the villages lead in all directions, and the village roads are directly connected with the Gaoyou Road, which provides extremely convenient transportation conditions for the implementation of the project. The power supply in the project area is sufficient, the power load is sufficient, and the power supply guarantee rate is high, which can meet the power consumption requirements of the project implementation and irrigation seasons.

4. Farmland productivity verification

4.1. Farmland productivity connotation

According to the "Technical Specifications for the Accounting of Agricultural Land Production Capacity" (special draft for the National Land and Resources Survey), agricultural land production capacity refers to the agricultural land production capacity formed in a certain region, a certain period of time and under certain economic, social and technical conditions. The cultivated land production capacity proposed by the balance of cultivated land occupation and supplement is mainly the grain production capacity of cultivated land.

The grades of cultivated land quality assessment reflect the annual yield of cultivated land. The quality of cultivated land in China is divided into 15 grades. Grade 1 has the highest yield per mu, with an annual production capacity of about 1,500 kilograms; about.

4.2. Method for assessing the productivity of arable land

In the dynamic supervision system of cultivated land occupation and supplement balance, the grain production capacity of cultivated land is calculated from the level of cultivated land area and cultivated land quality and utilization, and the unit is kilograms. The identification of the type and area of arable land shall be determined by the county-level agricultural and rural department in conjunction with the natural resource management department at the time of project acceptance.

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

In the formula, D refers to the capacity calculation constant, $D \leq 16$ (when the capacity is 0, $D=16$).

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

The average quality grade of cultivated land, the average quality grade before high-standard farmland construction, and the average quality grade after high-standard farmland construction: grades all refer to national use, etc., with one decimal place;

15: means 1 hectare = 15 mu;

100: Indicates kg/mu.

More about this source textSource text required for additional translation information

5. Cultivated land quality grade assessment results

After the construction of high-standard farmland, the national natural grade of cultivated land in the project area is 7, with a total of 1,040.1163 hectares; the national utilization grade of arable land is 6 and 7, of which 978.9242 hectares of 6-grade land and 61.1920 hectares of 7-grade land; the national economic grade of arable land is 8. 9th grade, of which 997.0023 hectares in 8th grade and 43.1140 hectares in 9th grade.

Before the implementation of the project area, the average national utilization rate was 7.0, and after the implementation, the average national utilization rate was 6.1, an average increase of 0.9. The newly added production capacity was 1.404 million kilograms.

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