

The Impact of Land Remediation Projects on the Quality Grade Assessment of Cultivated Land

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Abstract

The quality of arable land is an important quantitative description index to characterize the quality of arable land and the level of grain productivity. Comprehensive assessment of the quality of arable land is conducive to further understanding the quality of arable land and changes in productivity. Land remediation project engineering measures, soil fertilization, irrigation guarantees and other measures can significantly improve the level of cultivated land. This paper studies the classification of cultivated land after the completion of the land consolidation project in a Town, and the research method can provide a reference for the quality assessment of cultivated land in other land consolidation projects.

Keywords

Cultivated Land Classification; New Cultivated Land; Evaluation Method; Relevant Suggestions.

1. Introduction

Based on the actual national conditions of China and the 2022 Document No. 1, the agricultural industry remains an important field that must be further strengthened and improved in the future. Therefore, the importance of farmland utilization and protection also puts forward higher requirements for the development of the agricultural industry. Therefore, relying on land remediation projects, effectively increasing the area of cultivated land and significantly improving the quality of cultivated land will be a very important task in the land remediation process. Through the overall planning, the reasonable layout of field irrigation and drainage facilities can not only further improve the quality of cultivated land, ensure food production and food security, but also realize that the total amount of cultivated land in the region will not be reduced, promote the sustainable development of rural economy, and solve the Three Rural Issues. The evaluation of cultivated land grade is the most important factor for quantitatively analyzing and characterizing the quality of cultivated land. Through engineering measures, soil fertilization, irrigation guarantee, and other measures, it has a significant impact on the improvement of cultivated land quality. Therefore, the evaluation of cultivated land grade based on the purpose of improving grain production capacity is particularly important in the entire land improvement project. This article studies the grading evaluation of cultivated land after the completion of land consolidation projects, and the research method can provide reference for the quality evaluation of cultivated land in other land consolidation projects.

2. Basic Information of the Project Area

The land improvement project of Dongbao Village, YF Town, Pucheng County is located in YF Town, Pucheng County, about 30km away from the county seat. It is adjacent to Weizhuang Town, Chengxian County in the east, Dongchen Town bounded by Luohe River in the west, Duan's hometown in Dali County in the south, and Jiaodao Town, Chengxian County in the north. The project area is located in the northeast of the Guanzhong Plain (east diameter 109 ° 207 ')

17° -109° 54' 48", north latitude 33° 44' 50" -35° 10' 30"). The terrain of the project area is mainly loess plateau, with some gullies and rivers, mainly composed of red fill and yellow soil, and the soil fertility is the lowest level in the county. The annual sunshine is 2349.5 hours, and the frost free period is 224 days. The heat is the best in the county, which can meet the needs of two crops a year. But the average annual precipitation is only 506.2 mm, making it the most typical dry farming area in the county. Mainly wheat, rapeseed, and sweet potatoes, mostly maturing once a year or four times a year. The future development direction is to gradually establish production bases for key commodities such as grain, oil, mulberry, and fruits, and to comprehensively develop agriculture, forestry, animal husbandry, and sidelines. The total construction scale of the project is 7.9093 hm², with an additional 7.5138 hm² of arable land, and a new arable land rate of 95%.

3. Land Use Status in the Project Area

The project area is located on the Loess Plateau and is covered by other grasslands. The land use level in the project area is relatively low. According to the on-site investigation in the project area, the cultivation system is two crops per year. According to the project completion report and drawings, the construction scale of the project area is 7.9093 hm² (118.6395 acres), and all other grasslands were used before the renovation. According to the grading data of cultivated land quality in Pucheng County, the quality level of cultivated land around the project area is: National Utilization Grade 11. After rectification, 7.513 hm² (112.707 mu) of new arable land was added, with a new arable land rate of 95%. Rural roads account for 0.2375 hm², accounting for 3% of the construction scale, while farmland roads account for 0.1583 hm², accounting for 2% of the construction scale.

4. Evaluation Method

The Technology roadmap is to adopt the multi factor comprehensive analysis method, first determine the relevant parameters and grading factor index system for the farmland quality grading evaluation in the project area, then conduct field survey, collect the information value of the farmland quality grading evaluation index, and then calculate the natural quality score of the project area through the weight of the evaluation factors in each grading unit, and then obtain the national natural quality, etc The national utilization level and the national economic and ecological level are calculated, and the average level of land improvement projects is calculated. After passing the verification, a result package is formed, reported to the regulatory system, and the evaluation results are directly included in the annual update and evaluation of farmland quality level. At the same time, prepare a land quality grading evaluation map for the project, establish a land quality grading evaluation database for the project area, and write a land quality grading evaluation report for the project area.

5. Determination of Grading Factors

5.1. Determination of Grading Factor Indicator Area

According to the division results of the indicator areas in the Technical Guide for Cultivated Land Quality Grade Assessment of Land Improvement Projects in Shaanxi Province (2017), Pucheng County is located in the Loess Plateau area, the Fen Wei Valley area is the national secondary indicator area, and the Guanzhong Guanzhong area is the tertiary indicator area of Shaanxi Province.

5.2. Determination of Benchmark Crops

The benchmark crop is the conversion benchmark for theoretical standard grain, which refers to the main grain crops that are widely planted in a certain region and have a significant impact on the national economy and people's livelihood. According to the Trial Implementation of the Technical Guide for Cultivated Land Quality Grade Assessment of Land Improvement Projects in Shaanxi Province (2017), winter wheat is the benchmark crop in the Guanzhong Guanzhong where Pucheng County is located, with the maximum yield of 550 kg/mu.

5.3. Determination of Designated Crops

Designated crops refer to the crops involved in the standard farming system of the farming area under the jurisdiction of the administrative region. The designated crops for this cultivated land quality grading evaluation work are determined as winter wheat and summer corn in Pucheng County based on the "Technical Guidelines for Cultivated Land Quality Grading Evaluation of Shaanxi Province Land Remediation Projects" (2017).

5.4. Determination of Standard Farming System

According to Appendix 2-1 of the "Technical Guidelines for Evaluating the Quality Level of Cultivated Land in Shaanxi Province Land Remediation Projects" (2017), the standard farming system for each county (district, city) in Shaanxi Province is determined to be "winter wheat summer corn" in Pucheng County, and the multiple cropping type is "two crops a year".

5.5. Determination of Basic Parameters for Farmland Grading

According to the "Technical Guidelines for Evaluating the Quality Grade of Cultivated Land in Shaanxi Province Land Remediation Projects" (2017), the light temperature (climate) production potential index of winter wheat in Pucheng County was determined to be 1022, and the climate production potential index was determined to be 580; The light temperature production potential index of summer corn is 2286, and the climate production potential index is 1711. The maximum yield of designated crops in the Guanzhong Guanzhong where Pucheng County is located is 550 kg/mu for winter wheat and 650 kg/mu for summer corn. The yield ratio coefficient is 1.00 for winter wheat and 0.85 for summer corn. The maximum "yield cost" index of designated crops in the Guanzhong Guanzhong where Pucheng County is located is 0.84kg/yuan for winter wheat and 1.13kg/yuan for summer corn.

6. Evaluation Results and Analysis

By calculating the natural quality, utilization, and economy of each graded unit in the project area, the national average utilization of the entire project area is determined using the area weighting method. Table of cultivated land quality grading evaluation results for the land improvement project in Dongbao Village, YF Town, Pucheng County, Shaanxi Province. From this table, it can be seen that the evaluation results of the cultivated land quality grade of the land improvement project are: 11.0 grade for provincial-level nature, 12.0 grade for provincial-level utilization, and 7.0 grade for provincial-level economy; National Utilization Grade 10.0, National Nature Grade 9.0, National Economy Grade 10.0; The average utilization level of the country in the project area is 10.0.

To ensure the reliability of the classification, the resulting classification results were verified. Firstly, through self inspection, check the calculation process, results, grade calculation process, results, and area statistics of the project area index; Secondly, compare the calculation results with adjacent plots of the same land type to check the correctness of the attribute values of the evaluation factors and whether there is any phenomenon of jumping. Analyze the reasons for the differences in evaluation units that differ in grade from similar neighboring areas. After verification, the process and results of calculating the index and grade of the project area, as

well as the area statistics, are correct. Compared with adjacent plots of the same land type, the evaluation factor assignment is correct and correct.

Through land remediation, the factors that affect the quality of cultivated land have undergone significant changes. The surrounding cultivated land is all dry land, while the cultivated land after remediation is all irrigated. From the perspective of national utilization level, the national utilization level of cultivated land in the surrounding areas of the region is 11, while the utilization level of cultivated land in the project area reaches 10, which is 1 level higher than the surrounding level.

7. Related suggestions

According to the soil test results in the project area, the total nitrogen content is low and the available potassium is lower than the standard, so the nutrient status of the soil can be improved by increasing the application of Manure and chemical fertilizer, and the nutrient balance can be improved and maintained, and the soil nutrients can be adjusted by reasonable tillage, straw returning and other effective measures to achieve the goal of sustainable high and stable crop yield. Moreover, there is severe soil erosion in the project area, and it is necessary to continue to strengthen ecological protection and take effective measures to prevent soil erosion.

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