

# Feasibility Analysis of Construction of Land Consolidation Project in Jingbian County

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## Abstract

Jingbian County is rich in land resources and is one of the largest counties in Shaanxi Province. The project plans to carry out land remediation construction in areas with suitable soil and water conditions to form perfect cultivated land in terms of land leveling, irrigation and drainage, field roads, and farmland protective forest nets, and its feasibility is analyzed in order to provide reference for the project construction.

## Keywords

Land consolidation; cultivated land protection; construction and construction; feasibility.

## 1. Introduction

Cultivated land is the most precious resource in my country and an important prerequisite and guarantee for food production. As a basic system of cultivated land protection, the balance of cultivated land occupation and compensation is of great significance to achieve the goal of dynamic balance of total cultivated land and ensure national food security. In 2017, the "Opinions of the Central Committee of the Communist Party of China and the State Council on Strengthening the Protection of Cultivated Land and Improving the Balance of Occupation and Compensation" and the "Notice of the Ministry of Land and Resources on Improving Management Methods and Effectively Implementing the Balance of Occupation and Compensation of Cultivated Land" were released one after another. Establish a new balance of occupation and compensation based on quantity and production capacity as the core, and implement one-for-one, one-for-one for cultivated land, one for superior, and one for paddy field for paddy fields, and to promote the protection of the quantity, quality and ecology of cultivated land; Adhere to the concept of green development, change the way of supplementing cultivated land, expand the ways of supplementing cultivated land, broaden the channels of funds, and increase the input of supplementary cultivated land; for the historically formed garden land, residual forest land and other suitable agricultural land for development, it can be integrated into the agricultural land. In the scope of land remediation, the newly-added cultivated land is used for the balance of occupation and compensation, and at the same time, it gives full play to the role of guidance and leverage, actively innovates the implementation method, encourages rural collective economic organizations and farmers to invest in labor, and increases the investment in supplementary cultivated land funds and manpower.

## 2. Project construction area overview

The project area is located in Yangqiaopan Town, Jingbian County, involving three villages: Zhaozhuang Village, Gaofeng Village and Wangshawan Village. Between 26"~ 37°36'05.3".The landform type of the project area is Liangmaojian District in the middle of Jingbian County. The project area is basically self-developed cultivated land with low efficiency. The current crops are mainly corn and buckwheat, and the surrounding plots in the project area are all cultivated

land. More about this source textSource text required for additional translation information. Jingbian County has a semi-arid continental monsoon climate with sufficient sunlight, large temperature difference, dry climate, good ventilation conditions, rain and heat in the same season, and four distinct seasons. The main natural disasters are drought and low temperature frost, followed by strong wind and hail. The average annual rainfall is 395.4mm (348.3-431.3mm), and the average sunshine hours are 2768.2h (2516.1-3037.7h). The annual average temperature is 7.8°C, the effective accumulated temperature for plant growth of  $\geq 10^{\circ}\text{C}$  is 2800°C (2358.0-3356.2°C), and the annual average frost-free period is 130d (115-145d).

### 3. Project construction goals

Improve the supporting level of farmland infrastructure, optimize the structure of land use, improve the conditions of agricultural mechanization and large-scale production, enhance the ability to resist natural disasters, improve the ecological landscape, and promote the construction of new socialist countryside. Raise the natural quality level of arable land to a higher local level, and increase the comprehensive grain production capacity per mu by more than 100kg.

#### 3.1. Tian

By merging and leveling land and controlling soil erosion, the scale of contiguous fields is moderate, the thickness of the arable layer is increased, the land occupation rate of infrastructure is low, and the terraced field rate in hilly areas is increased. The thickness of the effective soil layer of the farmland is more than 50cm, and the thickness of the cultivated layer is more than 20cm.

#### 3.2. soil

Improve soil texture through soil improvement, increase the thickness of the ploughing layer of farmland, promote the popularization of good seeds and good methods, and increase agricultural production and efficiency. The organic matter content of the sandy beach area south of the Great Wall in northern Shaanxi after fertilization is greater than 7g/kg, and the organic matter content of the hilly and gully area after fertilization is greater than 9g/kg, and the nutrient content indicators should reach the "medium" in the local soil nutrient abundance index system. Or "high" value level, the soil PH value should be maintained at 5.5~5.8, the heavy metal content index of the soil in the plough layer should meet the relevant national standards, and the obstacle factors affecting the growth of crops should be reduced to a minimum.

#### 3.3. Water

By vigorously strengthening the construction of farmland water conservancy facilities, accelerating the promotion of water-saving and efficient irrigation technologies, increasing the effective irrigation area, improving the irrigation guarantee rate, water use efficiency and farmland flood control standards, the degree of water conservancy in agricultural production will be improved. The irrigation guarantee rate has reached more than 50%, the field engineering matching rate has reached more than 80%, and the irrigation water utilization coefficient has been significantly improved.

#### 3.4. Road

Through the construction of field roads and production roads, the problems of "road difference and unreasonable road network layout" in farmland can be solved, the width of the road surface can be reasonably increased, the load standard and accessibility of the road can be improved, the traffic requirements of agricultural machinery can be met, and agricultural mechanization shall be promoted. The number of fields directly accessible by field roads accounts for the

proportion of the total number of fields. The accessibility in plain areas is  $\geq 90\%$ , the accessibility in hilly areas is  $\geq 80\%$ , and the accessibility in mountainous areas is  $\geq 70\%$ . Require.

### 3.5. Forest

Through the construction of farmland protection and ecological environment maintenance projects such as farmland forest network and bank slope protection, the problems of imperfect protection system and low protection efficiency are solved. Expand the protection area of farmland, improve the ability to prevent wind erosion, reduce soil erosion, improve the ecological environment of farmland, and create an important ecological barrier for agricultural disaster prevention and mitigation.

### 3.6. Electricity

Combined with the construction of rural power grid reconstruction and other projects, by improving the rural power grid and supporting the necessary power transmission and distribution facilities, it can meet the power demand of existing wells, newly drilled wells, sprinkler irrigation and other facilities, reduce agricultural production costs, and improve the efficiency and benefits of agricultural production, consolidate the basic guarantee for the development of modern agriculture.

### 3.7. Skill

By accelerating the promotion of improved agricultural seeds and methods, vigorously develop agricultural mechanization, improve the agricultural technology socialization service system, enhance service capabilities, and improve the coverage rate of improved seeds and the utilization rate of fertilizers. The coverage rate of soil testing and formula fertilization technology promotion has reached more than 90%, the comprehensive mechanization level of cultivation and harvesting has reached 70%, and the coverage rate of improved seeds has reached more than 96%.

### 3.8. Tube

By clarifying management and protection responsibilities, improving management and protection mechanisms, improving management and protection measures, and implementing management and protection funds, it is ensured that the completed engineering facilities will not be damaged, the number of high-standard farmland will not be reduced, the map will not be changed, and the quality will be improved. The designed service life of the supporting infrastructure of the project shall not be less than 15 years.

## 4. Project construction standards

After the project area is completed, it should meet the needs of field management, agricultural mechanization and large-scale production; rationally arrange the arable fields, maintain the coordination and cooperation between various projects, and realize the complete supporting facilities of the field infrastructure. In accordance with the requirements of "High-standard Farmland Construction Standard Complex for Land Consolidation", "Planning and Design Specifications for Land Consolidation Projects", and "Technical Specifications for Farmland Soil Fertilization in Shaanxi Province" (DB61T966-2015), the occupancy rate of field infrastructure shall not be higher than 8%; The thickness of the cultivated layer is more than 30cm, the thickness of the effective soil layer is more than 60cm, the organic matter content of the wind beach area along the Great Wall of northern Shaanxi is more than 7g/kg, and the organic matter content of the hilly and gully area is more than 9g/kg, and the quality of the cultivated land has reached a higher level in the area; The service life of the infrastructure shall not be less than 15 years.

## 5. Feasibility Analysis

### 5.1. Soil status analysis

The current status of the project area is the cultivated land developed by farmers. According to the field survey of the project area, combined with orthophoto images, the topography, soil texture, irrigation and drainage facilities, existing roads and farmland protection conditions of each plot in the project area are analyzed. This determines the planning layout of each plot. Below is a list of typical plots for analysis of the current situation.

### 5.2. Analysis of new cultivated land sources

This project is a land development project, and the newly added arable land comes from the development of remnant forest land and grassland. The project meets the requirements for remnant forest land. The newly added cultivated land comes from the development of inferior forest land and grassland. The calculation method of newly added cultivated land uses the construction scale of each block to deduct the existing irrigated land and dry land in the project area, and deduct the land occupied by field infrastructure such as production roads and field roads, and farmland shelterbelts. The total land area of the project area is 69.0175hm<sup>2</sup>. After the completion of the project, after deducting the land occupied by rural roads and farmland shelterbelts, the newly added cultivated land area is 63.7808hm<sup>2</sup>, including 24.7279hm<sup>2</sup> of irrigated land and 39.0529hm<sup>2</sup> of dry land. The rate of newly increased arable land was 92.41%.

### 5.3. Benefit Analysis

After the implementation of the project, 63.7808hm<sup>2</sup> of new cultivated land can be added (including 24.7279 hm<sup>2</sup> of irrigated land and 39.0529 hm<sup>2</sup> of dry land), and the new cultivated land rate is 92.41%, which improves the land utilization rate and agricultural production conditions. The standard of living has important practical significance.

Promote the industrialization and large-scale development of the agricultural economy, establish green agricultural bases, enhance the agricultural production potential in the region, and accelerate the process of modern agricultural construction to promote regional economic revitalization and rapid development.

After the implementation of the project, part of the surplus labor force can be absorbed, providing employment opportunities for the local surplus labor force, effectively reducing the employment pressure and contributing to the stability of the local society.

## References

- [1] Zhao Qinglei, Jiang Guanghui, Xiong Chan, et al. Study on land consolidation function zoning and its consolidation direction[J].Chinese Journal of Agricultural Resources and Regional Planning,2021, 42(2):52-60.
- [2] LENG Ze-hua, HAN Feng. Analysis on Land Consolidation with Ecological Principle[J].Journal of Anhui Agricultural Sciences,2018, 46(8):73-75.
- [3] Xin GuixinYang , Chaoxian, Wei Chaofu, et al. Mode and practice of land consolidation based on human-earth harmonization[J].Transactions of the Chinese Society of Agricultural Engineering, 2015, (19):262-275.
- [4] Yang Min, Wu Kening, Li Chenxi, et al. Biodiversity protection of land consolidation[J].Chinese Journal of Agricultural Resources and Regional Planning,2017, 38(2):28-33.