

Feasibility analysis of high-standard farmland construction based on water-saving irrigation

Kun Li

Shaanxi Dijian Guantian Investment Construction Co., Ltd., Baoji, Shaanxi 721000, China

Abstract

High-standard farmland construction emphasizes the scientific leveling of land, strengthening power transmission and distribution of farmland, good irrigation and drainage, strengthening farmland protection, and rationally constructing relevant infrastructure such as ecological environment conservation projects to ensure that the quality of cultivated land remains high in the local area after completion. The quality of cultivated land is affected by the construction of supporting irrigation facilities, so it is necessary to scientifically apply water-saving irrigation technology during the construction of high-standard farmland, and ensure that farmland construction and agricultural development are supported by sufficient water resources under the support of relevant technical advantages. It is reasonable and efficient to save water resources at the same time, and promote the high-quality development of the country's modern agriculture.

Keywords

Water-saving irrigation; high-standard farmland construction; necessity; feasibility.

1. Introduction

The construction of high-standard farmland is a key measure to consolidate and improve grain production capacity and ensure national food security. With increasing grain production capacity as the primary goal, focus on arable land protection, soil fertility improvement and efficient water-saving irrigation, and vigorously promote the construction of high-standard farmland. The newly added cultivated land index for high-standard farmland construction will be included in the supplementary cultivated land index database, which can be used for cross-regional cultivated land occupation and compensation balance adjustment if it meets the demand for the balance of cultivated land in the region; in 2021, the "14th Five-Year Plan" and the outline of the annual long-term goal proposes to build 1.075 billion mu of high-standard farmland; the "National High-standard Farmland Construction Plan (2021-2030)" will build 1.2 billion mu of high-standard farmland by 2030, and increase the production capacity per mu of high-standard farmland Increase by about 100 kilograms; in 2021, the Central No. 1 document proposes to build 100 million mu of high-standard farmland with high yield and stable yield in 2021.

2. Project area overview

Lintong District, subordinate to Xi'an City, Shaanxi Province, is located in the east of Guanzhong Plain, with Lantian County in the south, Yanliang District in the north, Sanyuan County in Xianyang City in the northwest, Gaoling District in the west, Linwei District in Weinan City in the east, and Ba in the southwest. The bridge area is the boundary. It is between $109^{\circ}05'49'' \sim 109^{\circ}27'50''$ east longitude and $34^{\circ}16'49'' \sim 34^{\circ}44'11''$ north latitude, with a total area of 915 square kilometers. 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 rainfall has a strong seasonality, mostly concentrated in July, August and September. The average annual 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 earthquake intensity is VIII degree. 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 about 350-370m above sea level. The local farmers mainly use groundwater for domestic use, and the main form of agricultural irrigation water is the exploitation of shallow phreatic and surface water. At present, the current project area mainly exploits shallow diving, and has not yet exploited deep confined water on a large scale. At present, the yield of farmland is low and unstable, and the cost of cultivation is high, but the potential for land development is great. By investing a certain amount of manpower and material resources in the construction of high-standard farmland, high-yield, high-efficiency and high-standard farmland can be built.

3. State of infrastructure

3.1. traffic condition

There are G310 and X208 in the project area, there are highways between the county town and the two street offices in the project area, and there are rural highways between the villages and groups. The field production roads are basically formed, but the subgrade and surface layer are plain soil, and some roads are seriously damaged and the width is insufficient, so it is difficult to meet the current demand.

3.2. Status of irrigation and drainage facilities

In the project area, there are 36 canals of 68.4 kilometers in length, 154 canals of 172.5 kilometers in length, and 11 small pumping stations in two villages along the Qinghe River, Xinhua Juhe. In recent years, due to the disrepair of various water conservancy infrastructure projects implemented in the project area in previous years, and most of the lining channels have been damaged, some irrigation wells and small pumping stations have been scrapped; At the same time, most of the farmland cannot be irrigated in a timely and effective manner, which seriously restricts the increase of agricultural production and income.

3.3. Status Quo of Farmland and Forest Network Greening

The field forest network rate in the project area is not high, and it is mainly concentrated around the villages. There are basically no forest nets on the field roads and production roads, so the protection performance is low, and natural disasters such as drought and dry and hot wind occur frequently, which directly affects the crop yield.

4. Feasibility analysis of project construction

(1) Leaders attach importance to and policy support. The successive district committees and governments of Lintong District have attached great importance to agriculture and grain production, and have formulated a series of preferential policies and support measures to promote grain development, correctly guiding the infrastructure construction of agriculture, and increasing financial and technical input year by year to support the development of agriculture. The project is in line with the modern agriculture and new rural construction planning of Lintong District. So this project is feasible.

(2) The basic agricultural conditions are suitable. The mechanized deep loosening of the farmland in the project area can improve the permeability of the soil and increase the soil's

water and fertilizer retention capacity. By adding organic fertilizers, the physical and chemical properties of the soil can be changed, and the soil fertility and soil water supply, water retention and fertilizer retention can be improved. capacity, and have the basic conditions for the development of high-standard farmland construction. So this project is feasible.

(3) Rich in soil and water resources. The high-standard farmland construction project area in Lintong District is located in the Yellow River Basin and the Weihe River System. Although it is located in the Guanzhong area, the average annual rainfall is only about 553.3mm, but the project area is not far from the main stream of the Weihe River, and the groundwater resources are relatively abundant. The location of the project area is dominated by the alluvial plain of the Weihe River, and the soil is mainly loess and loam. The land is relatively fertile, and the cultivated land is concentrated and contiguous. The abundant groundwater resources and soil resources have laid a good natural foundation for the construction of the project area. So this project is feasible.

(4) The potential for synergy is obvious. The 37,000 mu project areas planned and constructed are all untreated low- and medium-yield fields, and there is a large room for growth in grain output. The project area has unique natural conditions, and local farmers have a fine tradition of intensive farming. Combined with the construction of low- and medium-yield fields, it can reduce irrigation water consumption, expand irrigation area, improve the matching rate of buildings, and improve the operation efficiency of agricultural machinery. Expanding the influence and contribution rate of science and technology to agriculture has huge economic benefits in many aspects, such as water saving, energy saving, production increase, land saving and labor saving, and the potential for increasing efficiency is very obvious. So this project is feasible.

(5) Since the Third Plenary Session of the 19th Central Committee of the Communist Party of China, the transfer trend of land management rights in the project area has gradually emerged, and the development momentum is good. Professional production models such as large grain farmers and cotton planters have emerged, further optimizing the industry for the project area. Structure, vigorously promote the construction of high-standard bases and laid a good foundation. In recent years, the practice of comprehensive agricultural development in adjacent areas has made the majority of cadres fully realize that the comprehensive agricultural development project is a "moral government project" and a "people's heart project", which can significantly improve farmland production conditions. Voluntarily raise labor and funds, devote themselves to development and construction, the enthusiasm for development is unprecedentedly high, and the project construction has a good mass foundation. So this project is feasible.

5. Conclusion

The project implementation area has superior social and economic environment conditions, abundant water resources, unique location advantages, and obvious industrial advantages; the project focuses on the construction of high-quality pollution-free crop bases, and strives to strengthen the construction of agricultural infrastructure, improve agricultural production conditions, and optimize agricultural production in the project area. The production structure will play an important role, the planning is scientific and reasonable, and the scheme is feasible; the agricultural products in the project area are of good quality, the market is broad, and there are favorable conditions for obtaining good economic benefits. In short, it is feasible in terms of technology, economy, organizational management, environmental impact, etc., in line with the national comprehensive agricultural development investment policy and the spirit of the central, provincial and municipal agricultural and rural work conferences. After the implementation of the project, the market competitiveness of agricultural products in the

project area can be improved. Promote industrialized operation, achieve the purpose of increasing agricultural efficiency and farmers' income, and vigorously promote the construction of new socialist countryside

References

- [1] Liu Haoxuan, Zhao Huafu, Qi Rui. Research on supervision and management mechanism of high standard farmland construction under multi-center governance[J]. Chinese Journal of Agricultural Resources and Regional Planning, 2022, 43(3):164-172.
- [2] Fang Linna, Li Jianmin, Chen Zixiong, et al. Practice of farmland construction in japan and south korea and their enlightenment to china's high standard farmland construction[J]. Chinese Journal of Agricultural Resources and Regional Planning, 2020, 41(6):1-6.
- [3] ZHAO Qian, CHEN Xiang. The Functional Appropriateness of Leading Group: Normative Essence of Agency Framework Clauses of High-standard Farmland Construction[J]. China Land Science, 2019, 33(3):9-15.
- [4] WANG Ke, LI Ling, LI Peng. Study on High-standard Farmland Construction Based on Ecological Security and Food Security[J]. Journal of Ecology and Rural Environment, 2021, 37(6):706-713.