

Problems and Solutions of High Standard Farmland Construction

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Abstract

The construction of high-standard farmland is an important strategic measure for Chinese agricultural development. It has far-reaching significance for improving the quality of cultivated land, promoting agricultural transformation and upgrading, ensuring national food security, and realizing the strategic goal of "storing grain on land and storing grain on technology." The report of the 20th National Congress of the Communist Party of China proposed to 'gradually build all permanent basic farmland into high-standard farmland', indicating the government's focus on farmland construction and its determination to solve the problem of food security in the future. Therefore, through field research, this paper finds that there are still some problems and difficulties in the construction of high-standard farmland at this stage, and puts forward specific countermeasures from four aspects: overall planning, scientific management, model exploration and platform supervision, so as to provide strong theoretical support for consolidating the foundation of food security.

Keywords

High Standard Farmland Construction; Food Security; Agricultural Modernization.

1. Introduction

Food security is related to global strategies such as human well-being, world stability and sustainable development[1]. Unstable, uncertain and unexpected factors such as the Russo-Ukrainian War, the Palestinian-Israeli conflict, and the world economic downturn have led to increased uncertainty in global food production, transportation, and trade. The supply chain of the food industry has been impacted, and global food security is facing major challenges. In the face of the complex international situation, China has also experienced a rapid decrease in the number of cultivated land, a large loss of high-quality cultivated land, and the occupation of ecological land by supplementary cultivated land, which seriously restricts the sustainable use of cultivated land resources in China and threatens national security[2]. At present, China is maintaining the red line of cultivated land by implementing a strict system of cultivated land protection.

The construction of high-standard farmland is an important measure to improve grain production capacity and consolidate the foundation of food security in China. It is also an important starting point for implementing the strategy of "storing grain in technology" and promoting the high-quality development of agriculture. The construction of high-standard farmland is an important starting point. We must unswervingly grasp it, improve the construction standards and quality, and truly achieve drought and flood harvest, high and stable yield. A comprehensive understanding of the base number of cultivated land, water resources, permanent basic farmland and high-standard farmland in various regions, combing the resource conditions and construction costs of permanent basic farmland to carry out high-standard farmland construction, and studying the permanent basic farmland in different

regions. The goal, duration, focus and path of building high-standard farmland will jointly promote the preparation of the national farmland irrigation development plan with the Ministry of Water Resources, and create favorable conditions for gradually building all permanent basic farmland into high-standard farmland.

2. Construction of High Standard Farmland in Shaanxi Province

Based on the characteristics of topography and geomorphology and the practice of high-standard farmland construction, on the basis of organizing experts to fully investigate and demonstrate and solicit opinions from relevant departments and cities and counties, the main promotion mode of high-standard farmland construction in Guanzhong, Northern Shaanxi and Southern Shaanxi was organized and formulated, so as to lead and accelerate the construction of high-standard farmland in the whole province. In the Guanzhong area, combined with the characteristics of the Guanzhong Plain, the construction mode of "canal and well double insurance-water-saving irrigation-efficient production" is mainly promoted; combined with the characteristics of Weibei dryland area, the construction mode of 'water diversion and storage-buried pipe-supplementary irrigation' is mainly promoted. In northern Shaanxi, combined with the characteristics of Liangmao hilly area, the construction mode of "one household, one field, soft water cellar, water-saving supplementary irrigation, planting and breeding cycle" is mainly promoted. Combined with the characteristics of the Chuandao area, the construction mode of "field consolidation-soil improvement-paddy-drought rotation-collective management" is mainly promoted. Combined with the characteristics of Mu Us Sandy Area, the construction mode of "saline-alkali control-soil improvement-irrigation and drainage combination" is mainly promoted. In southern Shaanxi, combined with the characteristics of Qinba mountain area, the whole basin construction mode of 'interception irrigation-land leveling-soil improvement' is promoted. Combined with the characteristics of Pingba area, the construction mode of 'irrigation combination-road access-ecological protection' is mainly promoted. Through the implementation of the project, the canals are connected, the roads are networked, and the trees are in rows to build high-standard farmland with dry energy irrigation, waterlogging energy drainage, and soil fertility [3]. According to the 'Shaanxi Province High Standard Farmland Construction Plan', by 2025, the province will have completed a total of 21.94 million mu of high standard farmland construction ; by 2030, the province will have completed a total of 26.17 million mu of high standard farmland construction. However, in the process of high-standard farmland construction, there are significant problems such as less investment, unreasonable planning and design, and unsustainable project income.

3. Problems in the Construction of High Standard Farmland

3.1. Unreasonable Use of Funds, Project Management is not Standardized

First of all, there are still illegal use of funds, illegal activities in project bidding, and non-compliance of acceptance procedures in high-standard farmland construction. Secondly, the project publicity system and supervision system are not in place. In the management of construction units, the good and bad are intermingled, and the high-standard farmland projects are scattered, mostly open construction sites, and the construction quality, standards and progress are difficult to guarantee. In terms of process quality supervision, the management personnel of some business competent departments are relatively insufficient, mainly relying on professional supervision. In engineering acceptance, relying on the work experience of project managers, lack of scientific data support, professionalism, technicality and authority need to be further improved.

3.2. Low Investment Standards, Less Financial Subsidies

The proportion of low-yielding fields in China is relatively high, and most of the farmland with good basic conditions has implemented high-standard farmland construction. The rest are remote areas, contiguous area is small, the original canal system and production road is very backward, resulting in the implementation of the project construction cost is generally high. In recent years, although the state has adjusted the investment standards for high-standard farmland construction projects, it still cannot adapt to the current trend of rising prices. Some farmland construction standards in the project area are low, and it is difficult to generally meet the high-standard farmland requirements of 'field prescription, road connection, canal connection, dry energy irrigation, and waterlogging energy drainage'.

3.3. After the Construction, the Supervision is Insufficient, and the Benefits Cannot Be brought into Full Play for a Long Time

After the construction of high-standard farmland, the overall project is required to be used for no less than 15 years, and it is difficult for the main body of project management and protection and the responsibility of management and protection to really land. In the construction of farmland, the phenomenon of 'heavy construction, light management and protection' is more common. High standard farmland management has high cost and low efficiency, and requires more than 10 years of management and maintenance time. However, due to the excessive emphasis on the operation and management concept of construction, ignoring the operation and management after construction, the lack of project management and protection subject, the weak management and protection responsibility, the lack of maintenance cost, and the backward monitoring and maintenance means, the effective management and protection time of the real responsible subject is only 1 year of the project quality assurance period. After the quality assurance period, there is a phenomenon of 'handing it over', 'no management, no repair', and it is difficult to continuously maintain high standard farmland.

4. Suggestions on the Construction of High Standard Farmland

4.1. Improve Project Investment Standards, Explore Villagers' Self-built Pilots, and Achieve Co-construction, Co-governance and Sharing.

(1) Increase project investment standards.

The country should be treated differently when formulating investment standards for high-standard farmland construction. The project investment standards should be raised to no less than 5000 yuan/mu. It is clear that the central, provincial and municipal (county) levels of finance should be shared at a ratio of 6:3:1 to ensure that the investment is in place, so that one piece of planning is implemented and one piece of implementation is effective.

(2) Explore the villagers self-built pilot work

On the premise of ensuring quality, capital and production safety, the agricultural and rural departments can pilot and guide villagers to deeply participate in project planning, project reserve, project declaration, evaluation and implementation, post-management and protection, which not only fully mobilizes their initiative and enthusiasm, but also reduces the expenditure of project funds in the intermediate links after financial evaluation.

4.2. The Introduction of Third-party Technical Service Companies, Consulting Or Entrusted Management, to Ensure the Scientific and Professional Construction and Management.

(1) Planning and design information, scientific

The third-party consulting company has professional technical and management personnel. Through the intelligent and information-based general exploration equipment, the third-party

consulting company uses the space-air-ground general exploration technology to find out the soil fertility and farmland site environmental quality within the construction scope. As an important basis for the restoration of farmland site conditions such as irrigation and drainage, field roads, farmland transmission and distribution, and ecological protection, the results of general exploration are used as an important basis for the restoration of cultivated land quality such as texture allocation, profile configuration optimization, and organic matter content improvement in high-standard farmland construction.

(2) Precision and ecology of construction construction

The third-party consulting company has advanced land consolidation and high-standard farmland construction technology. According to the planning and design scheme and the results of general exploration, the organic reconstruction technology of soil such as obstacle factor reduction, non-point source pollution prevention and control, and soil fertility improvement is adopted. The new materials and new processes of low carbon, ecology and environmental protection are used to break the plow pan through physical reconstruction, restore the soil aggregate structure, adjust the three-phase proportional relationship of soil, construct the soil structure of water storage and moisture conservation, stable structure and conducive to farming, and realize the 'high quality, concentrated and contiguous' of farmland, so as to realize the rapid and accurate improvement of fertility and the comprehensive improvement of soil ecological environment quality.

4.3. Explore the Market-oriented Operation Mode of Enterprise Construction and Management Integration, and Establish a Long-term Mechanism for Management and Protection after Construction.

(1) Implementing the 'investment-construction-operation' integrated model

Break the single 'who benefits, who manages, who uses, who manages' model, innovate the property right system, budget management and protection funds, incorporate the management and protection funds after the completion of high-standard farmland into the local financial budget, liberalize the construction rights of high-standard farmland, expand the management rights of high-standard farmland, encourage enterprises to invest in high-standard farmland construction such as investment and large-scale contracting, and use market means to build diversified management and protection entities such as management and protection models for business entities and third-party institutions. Encourage and support enterprises to participate in the whole process and life cycle.

(2) The development of modern new agriculture helps the virtuous cycle of post-construction management and protection.

Through land engineering technology to build 'fertile soil-supporting facilities-intelligent supervision' innovation chain, promote the integration and development of 'planting fertilizer industry-agricultural machinery industry-information agriculture' industrial chain, promote the transformation and upgrading of agricultural management mode, production mode and resource utilization mode, accelerate the development of quality agriculture, green agriculture and brand agriculture, and build high-standard farmland in food production, agricultural product processing, planting development, landscape shaping, characteristic agriculture, information agriculture, rural tourism and other aspects of the development of diversified industrial models to provide financial support for management and protection.

4.4. Cultivate Professional and Technical Personnel, Establish an Information-based Supervision Platform, and Build a High-standard Team Responsible for Professional Personnel and Professional Platform Supervision.

(1) Build a high-quality talent training system

Strengthen team building, pay attention to personnel training. We should adhere to the combination of the policy of making full use of talents and the revitalization of human resources, encourage the existing high-standard farmland construction talents to actively participate in guiding business management, technical support, consulting services, etc., play the role of 'transmission, help and guidance', and accelerate the training of a group of high-standard farmland construction tasks in the new period. Adapt to the professional talent team ; adhere to the combination of 'bringing in' and 'going out'. Increase the training of township and village cadres and personnel involved in high-standard farmland construction and management, and effectively improve the enthusiasm and initiative of the masses to participate in farmland construction and management.

(2) Establish an information supervision platform

Accelerate the application of information technology such as Internet of Things and intelligent control, promote the construction of farmland digital supervision platform, realize the real-time dynamic supervision of the whole process, adopt advanced technical means, such as UAV, satellite remote sensing, geographic information system, block chain and other modern information technology means, build an integrated monitoring and supervision system of 'sky-air-ground-machine', realize the well-documented, whole-process monitoring and precise management of high-standard farmland construction, improve the efficiency and accuracy of supervision, find problems in time and take measures to solve them.

5. Conclusion

The continuous development of high-standard farmland construction has effectively promoted the construction and development of modern agriculture. In the future, relevant departments must adhere to the principles of scientific and technological innovation, clear policy orientation, perfect market mechanism and full humanistic care, and constantly explore ways to adapt to China 's national conditions, promote the construction of farmland to an efficient, green and sustainable development path, in order to truly realize agricultural modernization, ensure national food security and promote the overall prosperity of the rural economy, promote the strategy of agricultural power and realize Chinese-style modernization. Under the background of globalization, the construction of high standard farmland is of great significance to the fluctuation of international grain market, the challenge of climate change, the restriction of resources and the development of global agriculture. To further enhance the global influence of Chese agriculture, out of a road of agricultural modernization with Chinese characteristics, to contribute to Chinese modernization.

Acknowledgments

Funding: This research was funded by Key Research and Development Program of Shaanxi,China (No.2022ZDLNY02-01). And Scientific Research Item of Shaanxi Provincial Land Engineering Construction Group (No.DJNY-ZD-2023-3).

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