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Construction conditions and potential analysis of high standard farmland

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Abstract

In the context of territorial space planning, in combination with the ongoing "one map" and "three zones and three lines" delimitation of territorial space planning, fully connect the relevant planning and control elements of natural resources, agriculture, water conservancy, ecological environment, forestry and other departments, and analyze the limiting factors of the construction potential of high standard farmland from five aspects, including the built projects, natural conditions, ecological protection, economic development and other management requirements, In order to avoid the conflict between the high-standard farmland construction project and the relevant planning or control elements, provide a more scientific and feasible planning basis for the special planning of the high-standard farmland construction in Pinghe County.

Keywords

High-standard farmland; Construction conditions; Potential; food safety.

1. Introduction

Cultivated land is the most precious resource in China, which concerns the food of more than one billion people. It must be protected and there must be no mistakes. In recent years, according to the decision and deployment of the Party Central Committee and the State Council, the relevant departments in various regions have actively taken measures to strengthen the main responsibility, strictly implement the system of balance between occupation and compensation, and strictly observe the red line of cultivated land. The protection of cultivated land has achieved remarkable results. At present, China's economic development has entered a new normal, the construction of new industrialization and urbanization has been further advanced, and the resources behind the cultivated land have been continuously reduced. It is increasingly difficult to realize the balance between the occupation and compensation of the cultivated land and the superiority of the cultivated land.

A comprehensive farmland protection system integrating quality and ecology. We will improve the management of the balance between the occupation and compensation of cultivated land, implement the strategy of storing grain in the land and storing grain in technology, and improve the comprehensive grain production capacity.The basic connotation of high-standard farmland refers to the high-efficiency farmland with high and stable yield, strong disaster resistance, good ecology, concentrated and contiguous areas, supporting facilities and adapting to modern agricultural production and management mode formed by land reclamation on the basis of basic farmland. The construction of high standard farmland is a fundamental project for the benefit of the country and the people. From the national level, it is an important grip to implement the "trinity" (quantity, quality and ecology) protection of farmland, and also an important way to realize the transformation from a traditional agricultural power to an agricultural power. From the perspective of rural economic development, the construction of high-standard farmland plays a very important role in promoting the intensive and economical

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use of farmland, achieving large-scale and mechanized farming, improving the living standards of rural residents, and achieving sustainable economic and ecological growth in the project area, especially for the implementation of the "rural revitalization" strategy and the "targeted poverty alleviation" policy currently advocated; In addition, the high-standard farmland construction project provides conditions for the settlement of emerging industries in rural areas and the cultivation of new business entities, thus providing guarantee for the realization of rural transformation and development, and promoting the process of urban-rural integration. From the perspective of environmental protection, the construction of high-standard farmland will carry out the concept of ecological civilization throughout, adhere to the overall coordination and improvement of the production function and ecological service function of cultivated land, effectively protect the biodiversity of cultivated land distribution areas, and help the sustainable use of cultivated land for agricultural production. Therefore, the construction of high standard farmland has become the focus of land remediation work.

Therefore, through the research on the construction potential of high standard farmland, we can understand the topography, soil conditions, farming convenience, socio-economic conditions and farmland protection conditions of high standard farmland construction, find out the key factors that affect the construction of high standard farmland, supplement the production capacity of new farmland projects for the balance of occupation and compensation, and seek engineering, biological and other technical means to achieve the steady increase of output, and implement the requirements of "occupy one to supplement one, occupy the superior to supplement the superior, occupy the paddy field to supplement the paddy field", Ensure that the balance of arable land occupation and compensation is implemented.

2. Current situation of high-standard farmland construction

ADomestic experts and scholars mainly focus on the feasibility and suitability evaluation of high-standard basic farmland construction, as well as the site selection, regional delimitation and construction timing of high-standard basic farmland construction. For example, with the help of multi-factor analysis and GIS technology, Huairou District is taken as the research area to explore the suitability of the construction of high standard basic farmland and provide a basis for determining the construction scope of high standard basic farmland; Taking Zhecheng County as an example, the feasibility of the construction of high standard basic farmland was explored, hoping to improve the farmland cultivation conditions of Zhecheng County through the construction of high standard basic farmland project. The feasibility and suitability evaluation study provides a basis for the site selection, layout and overall planning of high-standard basic farmland construction projects; Taking Dianjiang County, a hilly and mountainous area in the southwest of China, as the study area, the suitability of the construction of high standard basic farmland was evaluated with the help of niche model. On this basis, the construction area of high standard basic farmland is demarcated with the help of multiple constraints, which provides a theoretical basis for determining the construction scope of high standard basic farmland in the future.

3. Research method

3.1. IData source and preprocessing method

The required data are mainly provided by the county-level natural resources bureau and the agricultural bureau. Since the data obtained come from different departments, the data obtained have different formats, such as MapGIS format file, ArcGIS format file, CAD format file, JPG format file. In addition, the data of land improvement planning includes documents, tables and other data types. First, convert different data types into ArcGIS vector file type, namely. shp file; Then set unified coordinates, topology check and other steps for all converted files through

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ArcGIS software; Finally, import all the required files into the newly created ArcGIS database to facilitate subsequent data processing.

3.2. Determine the evaluation unit

The evaluation unit refers to the smallest unit of the evaluation object with relatively uniform internal attributes, including natural features such as landform, soil, climate or other economic features. The evaluation unit division methods include block method, grid method and overlay method. For the division of high-level basic farmland construction evaluation units at the county level, some scholars take administrative villages as evaluation units, and some take cultivated land plots as evaluation units. The former takes the administrative district as the evaluation unit, which provides convenient operation in the implementation of government policies, but it is not accurate to the specific plot and is not precise enough. Therefore, this paper takes the plot as the minimum evaluation unit, extracts the basic farmland pattern from the land improvement planning database, and obtains the evaluation unit plot after the verification of topological rules.

3.3. Build evaluation index system

According to the Code for the Construction of High-standard Basic Farmland, the construction of high-standard basic farmland mainly includes five categories: land leveling project, irrigation and drainage project, field road project, farmland protection and ecological environment project and other projects. According to the construction content of high standard basic farmland, this paper constructs a high standard basic farmland potential evaluation index system from two aspects of farmland endowment conditions and external resource allocation conditions, based on the principles of integrity, diversity, representativeness and operability. The endowment conditions of farmland include soil organic matter content, effective soil layer thickness, soil texture, soil PH value and field slope; The external resource allocation conditions include irrigation assurance rate, drainage conditions, road network density, distance from the field to the main traffic line, field connectivity and vegetation coverage, a total of 11 indicators.

4. Selection of potential limiting factors

The base of the analysis of the construction potential of high standard farmland is the farmland of the 2020 land change survey results. According to the data of various departments, the limiting factors are divided into five categories: built projects, natural conditions, ecological protection, economic development and other management requirements. The completed projects mainly include the results of "unified map of high standard farmland construction" and "land improvement projects accepted in 2011-2020". Among them, the results of "unified map of high standard farmland construction" include the projects accepted by the county-level natural resources (land), agriculture, development and reform, finance, water conservancy and other competent departments in 2011-2020; "Land consolidation projects accepted in 2011-2020" include land consolidation, development and reclamation projects accepted by the natural resources department (original land) in 2011-2020. The natural conditions mainly consider the slope of cultivated land. High-standard farmland construction is not suitable for farmland with a slope of more than 25 degrees. The limiting factors of ecological protection include the red line of ecological protection, the blue line of riverine ecological protection, the first-grade protection area of drinking water sources, the protection range of drinking water sources for rural centralized water supply with more than 1000 people, ecological public welfare forests, natural reserves and natural forests.

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5. Conclusion and prospect

At this stage, we should take the current cultivated land as the base number, select the existing projects, natural conditions, ecological environment, economic development and other management requirements and other limiting factors to carry out potential analysis and calculation. The results can be used as the basis for the special planning project arrangement of Pinghe County's high standard farmland construction, and generate the high standard farmland construction project database by 2030, It can avoid conflicts caused by different design units' inability to grasp or consider the planning and control elements of various departments, thus improving the scientificity and feasibility of high-standard farmland construction projects.

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