Research on Spatial Planning System and Construction of Yellow River from the Perspective of Natural Resources

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Abstract: Land and space planning are a guide for national space development and a blueprint for sustainable development. It is the basic basis for various development and protection activities. The state implements the “five-level and three-category” land-based spatial planning system. The “five-level” refers to five levels: national, provincial, municipal, county, and township; “three types” refers to three types: overall planning, detailed planning, and special planning. The article introduces the background of land and space and the background of the Yellow River ecological belt, and expounds the spatial planning system of the Yellow River ecological belt. It elaborates from the data management system, intelligent evaluation system, planning system, planning management system, planning application system and monitoring and supervision system. The construction of spatial planning platform provides an attempt to solve the problem of ecological protection of river basin resources, coordinating the economic development along the Huangjiu Province, and establishing the overall, systemic cooperation mechanism of the upper, middle and lower reaches.

1. Research background

We have entered a new era in China's development. General secretary Xi Jinping once stressed that “scientific planning is the biggest benefit, planning mistakes are the biggest waste, planning setbacks are the biggest taboo.” He pointed out at the central urbanization work conference that “we will continue to explore the integration of economic and social development planning, urban planning and land use planning in cities and counties or the integration of multiple plans, formulate a plan and a blueprint to guide development, and unswervingly implement”. China's national new urbanization plan (2014-2020) released in March 2014 clearly stipulates that the reform should focus on the establishment of the space planning system, promoting the reform of the planning system and the main framework of planning legislation. In December 2015, Xi Jinping presided over the central city working conference. He proposed that all kinds of spatial planning should be based on the main functional area planning, accelerate the “integration of multiple plans” and the coordination of the three major layout “production, life and ecology”, and strive to improve the livability of cities. In March 2018, China's ministry of natural resources integrated functional zone planning, land planning, urban planning and other functions after institutional reform. “Planning is land space planning, not urban planning, not land use planning,” said Luhao, the new minister of natural resources [1]. Spatial planning is not a simple “Mosaic” of the plans of various departments, but a three-dimensional, comprehensive and unified planning system covering cities, land, land and sea, agriculture and rural areas, environment, above ground and below ground, and ecology. It is a systematic and structured planning system. Land space planning is a guide for national space development and a blueprint for sustainable development. It is the basic basis for all kinds of development, protection and construction activities. It is imperative to establish land space planning system and platform construction, realize “integration of multiple plans”, and strengthen the role of land space planning in guiding and constraining various special plans. In September 2016, the outline of the development plan for the Yangtze river economic belt was officially issued. In November 2018, the state made it clear that the Yangtze river economic belt should give full play to its geographical advantages as it spans the three major sections of the east, west and east, and

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promote coordinated development of the upper, middle and lower reaches of the Yangtze river and high-quality development of the areas along the river by relying on the golden waterway. In October 2018, the state council approved the Huaihe river ecological economic belt development plan and the Han river ecological economic belt development plan, and these two national strategies also emerged. Looking at the map, the Huaihe river basin is located between the Yangtze river basin and the Yellow River basin. As the largest tributary of the Yangtze river, the Han river is also known as “river Huai Han” with the Yangtze river, the Yellow River and the Huaihe river. At a time when all three rivers are on a new mission, China's second longest river, the Yellow River, in the north, cannot stand still. Specific to the extensive Yellow River ecological belt construction, along the river provinces have action. Last year, in the two sessions of Henan province, Jiusan society, Henan provincial party committee outlined a belt along the yellow ecological culture industry, and proposed specific and feasible ways for financing and construction. At present, Henan provincial development and reform commission has carried out key work on relevant Suggestions. Shaanxi province, in April 2017, Shaanxi provincial government held a symposium on the construction of Yanhuang town belt, which clearly proposed that yanhuang area would accelerate the construction of Yanhuang ecological town belt by centering on the overall spatial layout of “one park, two groups, three pieces and four cores”. In Shandong, Binzhou, the Yellow River city at the north gate of Shandong, is making great efforts around the Yellow River ecology, creating Binzhou “gold belt” along the yellow ecological economic belt. The ecological environment protection in Ningxia this year will also focus on three regions: Yinchuan metropolitan area, the yellow ecological economic belt, the central arid belt and the mountainous areas in the south, to promote high-quality economic development and high-level ecological environment protection [2]. How to take into account the ecological protection of the river basin resources, how to coordinate the economic development of the nine provinces along the Yellow River, and how to establish the overall and systematic cooperation mechanism of the upper, middle and lower reaches are the major problems facing the spatial planning of the Yellow River economic belt.

2. The spatial planning system of the Yellow River ecological belt

2.1 Development of the national space planning system

The country will implement a national spatial planning system of five levels and three categories. Specifically, “five levels” refers to the overall level of the Yellow River ecological belt and the five levels of provinces, cities, counties and towns along the Yellow River. “Three types” refer to three types of overall planning, detailed planning and special planning. Among them, the overall plan is the arrangement, implementation and refinement of the land space protection, development, utilization and restoration of the Yellow River ecological belt. Detailed planning to make implementation arrangements for specific land use and development and construction intensity; Special planning refers to the special planning of space utilization in a specific region (watershed) and specific field.

Five levels, three categories

Table 1 Five levels, three categories

<table>
<tr><th>Overall planning</th><th colspan="2">Detailed planning</th><th>Relevant special planning</th></tr>
<tr><td>National spatial planning</td><td colspan="2" rowspan="2"></td><td>Special planning</td></tr>
<tr><td>Provincial spatial planning</td><td>Special planning</td></tr>
<tr><td>Municipal spatial planning</td><td rowspan="3">Within the boundary</td><td rowspan="3">Outside the boundary</td><td rowspan="2">Special planning</td></tr>
<tr><td>County spatial planning</td></tr>
<tr><td>Town spatial planning</td><td></td></tr>
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Four systems

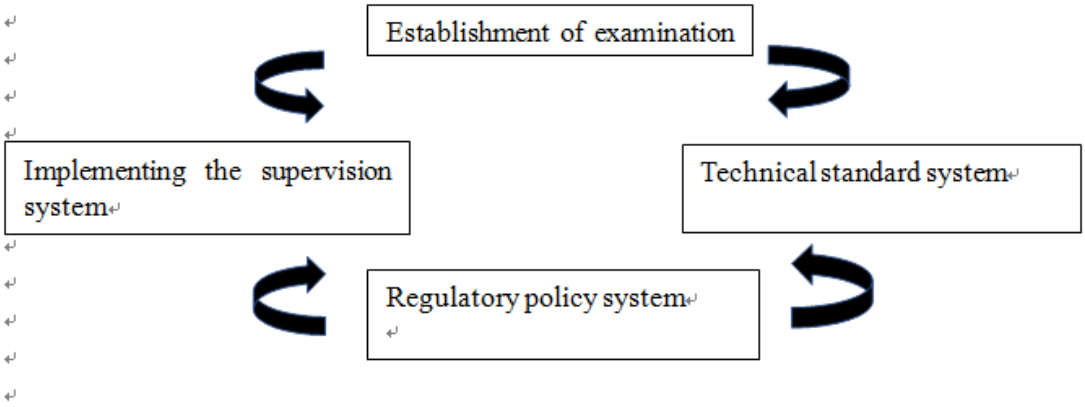

Fig.1 Four systems

2.2 Yellow River ecological belt space planning system construction

During a visit to Gansu province in August 2019, Xi Jinping stressed the importance of protecting and improving the Yellow River. We will continue to take comprehensive, systematic and source measures to improve the quality of land, water, forests, fields, lakes and grasses. We will promote coordinated efforts in all areas, strengthen coordination, and work together to ensure greater protection and better governance. The next step is to carry out a special study on the protection and high-quality development of the Yellow River basin, so as to promote high-quality development of the Yellow River basin and make the Yellow River a happy river for the benefit of the people. In September 2019, the symposium on ecological protection and high-quality development of the Yellow River basin was held in Henan. Xi Jinping stressed: First, strengthen ecological and environmental protection; Second, to ensure the long peace and stability of the Yellow River; Third, promote the economical and intensive use of water resources; Fourth, promote high-quality development of the Yellow River basin. Sun Yunfeng, deputy to the National People's Congress and director of the water resources department of Henan province, proposed: Yellow River ecological zone planning should to Xi Jinping, ecological civilization thought and the new development concept as a guide, adhere to the “ecological priority and green development” and “total catch big protection, don't make big development” principle, with “no levee breaches, no depletion, no pollution exceeding the standards and no rising of the river” as the goal, overall regional layout, ecological protection, infrastructure construction, industrial development, at the same time and the Bohai sea economic zone, the central plains economic zone, Xi 'an - Tianshui economic zone of corresponding regional development strategy planning, We will build a water and sediment control system, a flood control and silt reduction system, a comprehensive water and soil erosion prevention and control system, a water and water ecological protection system, a rational utilization and efficient allocation system of water resources, and a comprehensive watershed management system, so as to form a planning pattern in which the “six major systems” give overall consideration to each other and complement each other. The author attempts to from the system, the emphasis of ecological construction of the basin ecological environment system, ecological water use and configuration system, urban agglomeration development along the yellow system, system construction of the Yellow River ecological belt along the yellow river economic industry development spatial planning system, which extends from the data management system, intelligent evaluation system, planning system, planning management system, application system, monitoring system and other aspects to carry out the space planning platform construction.

3. Construction of space planning information platform

3.1 Necessity of platform construction

China's current spatial planning mainly includes urban and rural planning, national economic and social development planning, general land use planning and environmental protection planning. The specific project planning of each department is different in functions, work objects, technical

standards, implementation and other levels [3]. There is a lack of unified and coordinated mechanism, data standards and standards and data system among various plans, and the project approval is cumbersome and lengthy, making it difficult to implement the project. The platform for constructing space planning information (multiple plans in one) is conducive to unified standard frame and integrated data resources, so as to realize joint construction, sharing and sharing of information, eliminate conflicts and contradictions among various plans, and provide technical support for information communication and business collaboration for space planning, project approval and management.

3.2 Platform construction objectives and main contents

Rules for “unity” for the overall work goals, adhere to “a cities and counties, a plan, a blue map” core idea, the solid line as a whole the development method and platform, based on the unity of rules and technical standard and working mechanism, establish rules more comprehensive database, implementation planning, land, hair change and environmental protection departments planning achievements of unified management, to eliminate contradiction space, realize the unity. Use the integrated service system to realize multi-gauge information online service and improve the space management ability [4]. Lord to include platform construction within the space of delimit gauge data standards specification construction, each department result data resources of the whole, each door data show the browsing, planning results contradiction is don't and coordination, each department door data resources related query, planning land use information remit total, the ministry doors to the class information summary, auxiliary selection of construction project site, building project review and gauge set, leading desktop, comprehensive services framework, operational environment construction, etc.

3.3 Platform technical framework

This paper adopts B/S and C/S mixed double driven architecture, of a series of ArcGIS software to build the GIS software platform, with large Oracle database background data management, using the model of 1 + N (more than a gauge or a general number according to the department of library and N door designed industry a library) in the form of data center set up a unified planning, build into for more rules harmonization, management standardization, the integration features such as the results of application system.

The spatial planning information platform mainly includes data management system, intelligent evaluation system, planning compilation system, planning management system, planning application system and monitoring and supervision system. Planning will be based on the unified geodetic coordinate system 2000, based on a GIS software platform, the third in the national land survey data for the data blank, according to the standard, expression of the spatial data specification, unified land classification standard, unified data algorithm for space area, in the “national spatial planning” on the basis of basic geographic information database, constitute a unified planning results database. Based on the basic geographic information database of “land space planning”, a unified database of planning results is formed.

According to the data types, the data resource system can be divided into basic geographic information database, status planning database, preparation result database, parallel approval database and other data database. A. Basic geographic information data: including basic geography, remote sensing image, geographical national conditions, land utilization status, cultivated land reserve resources, mineral resources, etc., to provide data basis for grasping the real status of national space and the development, utilization and change status of national space; B. Status planning data: including status data of various types of planning at the provincial, municipal and county levels, to prepare for the preparation of land space planning; C. Preparation of results database: mainly including planning and preparation results and data of various special reports; D. Parallel examination and approval database: it is the data generated in the process of administrative examination and approval, including real estate registration, land examination and approval, land supply, mining right examination and approval, etc., providing data basis for the implementation of post-approval supervision; E. Other data database: dynamically acquire data, including population

and macro-economy, and conduct comprehensive analysis and decision-making by combining current events, public opinions and other information.

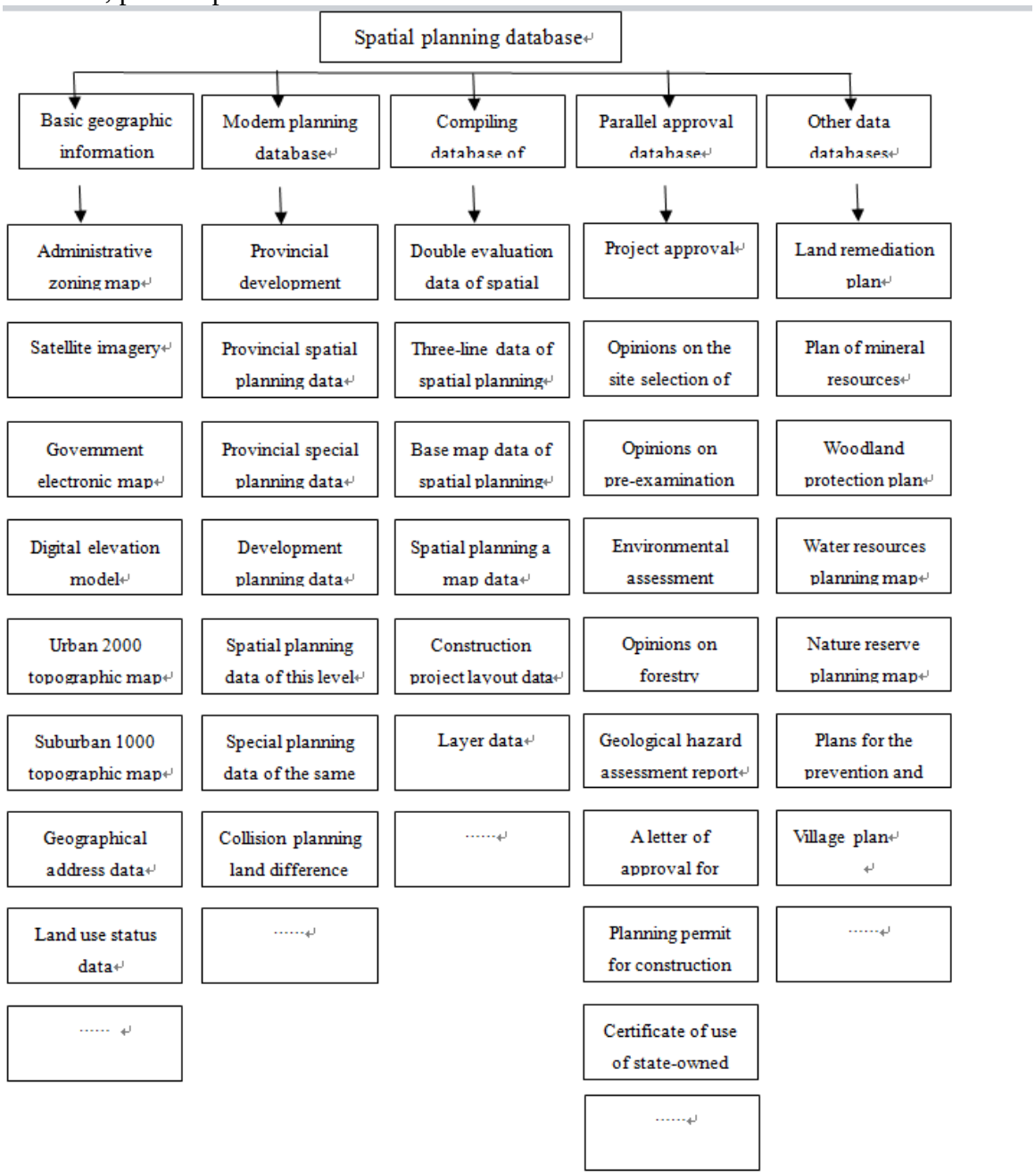

Fig.2 GIS software platform

Combined with the analysis of the functional requirements of the information platform for land space planning, the platform construction mainly includes six systems, namely, data management system, intelligent evaluation system, planning compilation system, planning management system, planning application system and monitoring and supervision system.

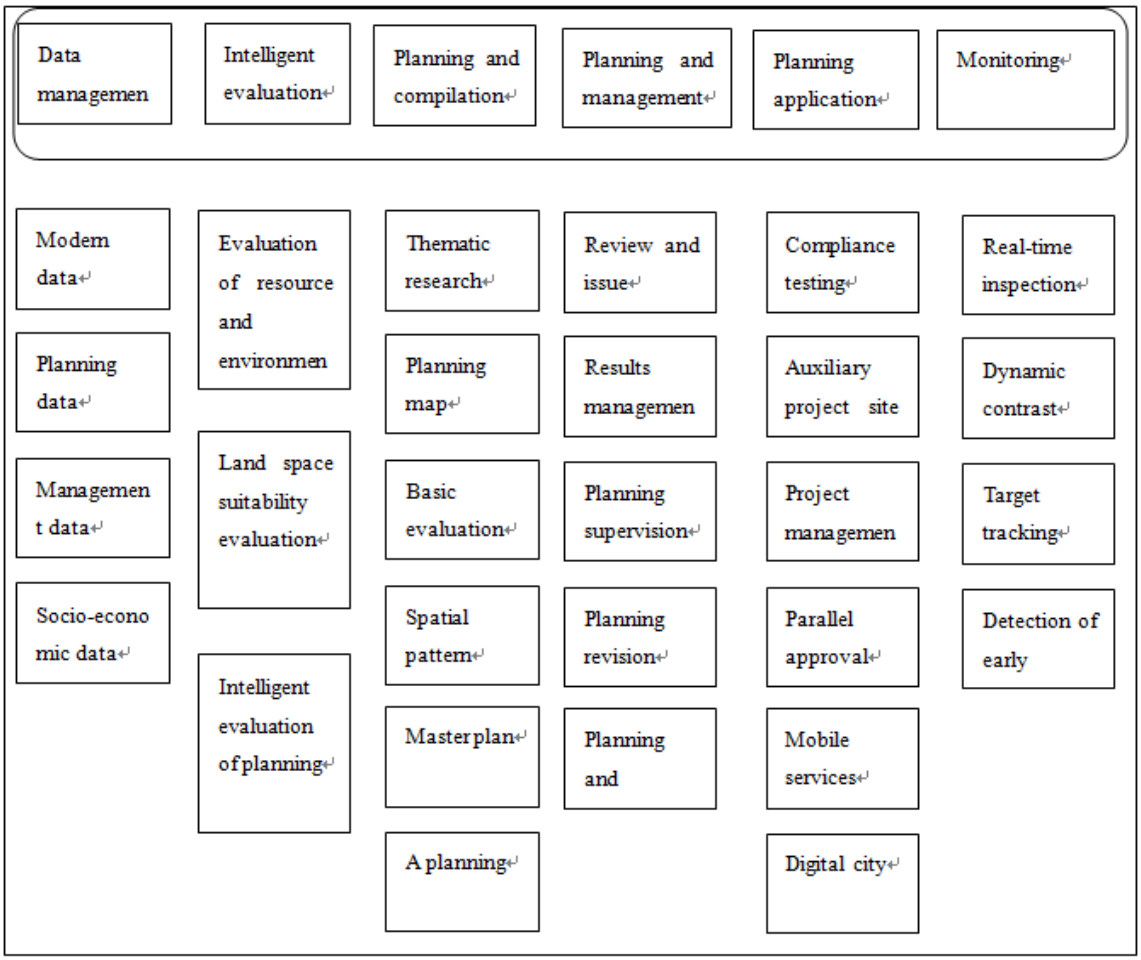

Fig.3 six systems of the platform

a) Data management system. The basic data, planning data and social and economic data of the current situation of the Yellow River ecological belt are monitored in real time, and the changes of statistical data are timely. Carry out real-time data analysis to obtain relevant information such as planning and implementation.

b) Intelligent evaluation system. The main purpose is to comprehensively evaluate the bearing capacity of resources and environment and the suitability of land development [5]. Through control, real-time evaluation of water resources, natural ecology, cultivated land resources, geological disasters, atmospheric environment and other factors, and real-time observation of the changes of the comprehensive carrying capacity of resources and environment in the Yellow River ecological belt.

c) Planning and preparation system. All planning results are compiled into a subsystem, which can be implemented to check the planning indicators, land types, infrastructure layout and other elements of each site.

d) Planning management system. The planning management system mainly manages the planning achievements, planning land use, planning modification, planning review and land use evaluation. The authoritativeness of planning shall be strictly implemented, and the planning results shall not be arbitrarily changed except in special circumstances.

e) Planning application systems. The planning application system is mainly manifested in the control index, which is mainly responsible for implementing the control function. The system is used for real-time control and strict management of construction project location, project construction management, project approval and other processes. Build smart city and digital city through project information control.

f) Monitoring and regulatory systems. The main function of the planning supervision system is to monitor the status of urban construction in real time, conduct dynamic comparison at certain intervals, and analyze the development trend of the city. Follow up the target of each project and

monitor the progress and legal compliance of the project at any time.

3.4 Platform function design

It includes multi-planning results conflict detection and contradiction identification, multi-planning space information application, multi-planning auxiliary decision application and multi-planning operation and maintenance management subsystem.

1) Multi-programming results conflict detection and conflict identification

The system realizes the quality inspection of multi-plan results based on standards and specifications, and the difference identification rules are flexible and adaptable. The contradiction identification of multi-plan results is completed by unified standards and regulations, and technical support is provided for multi-plan integration and overall urban planning. Based on land classification standards and difference rules, the paper analyzes the planning data of each department that meets a certain standard, automatically and quickly identifies the contradiction between plans, solves a large number of small difference areas caused by drawing accuracy and other problems, and quickly generates all kinds of difference statistical ledger and difference analysis thematic map [6].

2) Display and browse data resources of each department

Achieve the land, planning, development and reform, environmental protection and other departments at all levels of leadership, the relevant personnel of the business office, can quickly browse to the relevant data resources of each department, including graphic data, planning text data and integrated display of graphics, support multi-screen browsing, two three-dimensional browsing and other viewing methods.

3) Data resource association of various departments

The query can reflect the relationship between various kinds of plans through the way of the split screen comparison of graphic data and the correlation query of material information, such as the original planning situation of the difference map spot of two regulations, and the text, files and pictures of the corresponding sector planning. The information correlation of querying items in different stages includes graphics, indicators, files, review information and so on.

4. Summary

From the perspective of natural resources, it is the key reform of current space planning to eliminate malpractices by integrating resources and power and to build a unified and interrelated space planning system with hierarchical management. Spatial planning information platform can effectively organize and manage all kinds of spatial planning data, and build an intelligent, simplified and integrated information application system to promote the real realization results of spatial planning. The construction of the spatial planning platform for the Yellow River ecological belt will also better promote the integration of planning results and the application of information sharing, promote the development of quantitative, intensive and refined spatial planning management, and enhance the comprehensive competitiveness of the Yellow River ecological belt.

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