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Spatial Governance of Multi–Plan Integration in the County Area: A Case Study of Sihui City

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Abstract This study discussed the contradiction and reform experience of multi-plan integration in Sihui from the perspective of spatial governance. The research found: in terms of contradictions, the right and responsibility of management departments in the county area of Sihui were cross-cutting, the township governance responsibilities needed urgent improvement, the urban-rural governance problems were different, the spatial governance elements were not unified, and the contradiction in the implementation mechanism was the implementation of projects. Through the multi-plan integration reform, Sihui reconstructed the right and responsibility relationship of the spatial governance departments, unified the elements of spatial governance, and refactored the implementation mechanism by reconstructing the transmission mechanism of the spatial planning system and the project approval mechanism and establishing the dynamic evaluation and adjustment mechanism.

Keywords County area, Multi-plan integration, Spatial governance
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Spatial governance is the social, economic, and political relationship governance of land and natural resources as its entity. Its core goal is to realize the scientific and rational allocation of land space[1]. China is carrying out spatial governance reform and spatial planning is an important means. Since China has not yet formed a unified spatial planning system, there are "contradictions and conflicts" among various plans. Thus the "multi-plan integration" reform is put on the agenda. "Multi-plan integration", which has developed from the "two-plan integration" and "three-plan integration", has gone from land use coordination and technology convergence to the depth of the power reform[2], with the goal of clarifying the right and responsibility mechanisms of various spatial governance departments.

At present, breaking the "urban-rural dual system" and coordinating urban and rural development is an important goal of spatial governance reform. And the county area connecting the city and countryside has become the focus of attention. The county area faces not only difficulties in multi-plan integration coordination at the municipal level and above, but the imperfectness of the village-town planning system within its domain. In this context, how to clarify the right and responsibility mechanism of the vertical and horizontal spatial governance departments within the county is urgently needed to be studied. Overall, the current case studies focus on the multi-plan integration path[3-4] and the spatial governance system[5-8]. Some scholars have explored the core content[9] and the technology path of multi-plan integration[9-10]; some scholars have studied the difficulties of multi-plan integration in cities and counties from the perspective of game theory[11], and constructed the overall framework of multi-plan integration[12]. For the study of spatial planning system reconstruction, scholars have drawn lessons from international experience[13-14], or conducted problem-oriented studies[15-16], or studied from a historical perspective[17]. Some scholars have also summarized the progress and shortcomings of plan coordination from the perspective of governance[18-20]. In general, there is little discussion about the spatial governance of multi-plan integration in the county area.

Sihui, is a county-level city in Zhaoqing, Guangdong, China. It administers 3 subdistricts including Chengzhong, Dongcheng, and Zhenshan subdistricts, as well as 10 towns including Longfu, Didou, Weizheng, Luoyuan, Jingkou, Dasha, Shigou, Huangtian, Jianggu, and Xiamao towns. In 2014, it became one of the "28 pilot cities and counties for multi-plan integration reform". At the beginning of 2016, Sihui reported the results of "multi-plan integration" to the Ministry of Housing and Urban-Rural Development and was affirmed. Based on the perspective of spatial governance, this paper summarized the contradiction and reform experience of multi-plan integration in Sihui, with the purpose of exploring the problem of multi-plan integration and spatial governance in the county area.

1 Spatial governance of multi–plan integration

Spatial governance stems from governance and urban governance[21], which refers to the interaction or coordination of various governance entities around "space resource allocation". The essence of this is the right and responsibility mechanism of the governance subjected on "space resource allocation". Among them, spatial governance entities include the government, market and society. In China, the government is the authority of governance, and spatial governance entities mainly refer to departments that are responsible for spatial planning and management, such as the development and reform commission, the ministry of housing and urban-rural development, the ministry of natural resources, and the ministry of ecology and environment. In the urban development and construction, social entities such as real estate developers and residents in old city renovation will also be included.

"Multi-plan integration" is a unique concept in China. "Multi-plan integration" as well as "two-plan integration" and "three-plan integration" can be traced to the same region. It is a reform to solve the complicated relationship

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between various plans in China. It aims to reconstruct China's spatial planning system and disentangle the right and responsibility mechanism of spatial governance entities.

From the perspective of spatial governance, multi-plan integration can be understood as the interaction or coordination of different spatial governance entities (spatial governance departments) around the construction of "a blueprint". "A blueprint" has become a core governance element. Interaction or coordination refers to the right and responsibility mechanism in plan preparation, approval, and implementation.

2 Contradictions in multi–plan integration of Sihui

2.1 Conflicts between spatial gover–nance entities

2.1.1 The overlapping of right and responsibility of spatial governance departments in the county. First of all, the four major spatial governance departments (the Bureau of Development and Reform, the Bureau of Housing and Urban-Rural Development, the Bureau of Land and Resources, and the Bureau of Environmental Protection) have implemented county spatial governance zoning. Secondly, there are overlapping elements of space control in the various spatial governance departments, and the elements of the Bureau of Housing and Urban-Rural Development and the Bureau of Land and Resources have overlapped most. Thirdly, in the implementation of the construction project, the boundaries between powers and responsibilities of the Bureau of Development and Reform, the Bureau of Housing and Urban-Rural Development, and the Bureau of Land and Resources are blurred. In the management and protection of water resources, the Bureau of Water Resources and the Bureau of Environmental Protection have blurred responsibilities. In the protection of farmland resources, the responsibilities between the Agriculture Bureau and the Bureau of Land and Resources are blurred. In the protection of forest resources, the responsibilities of the Bureau of Environmental Protection and the Forestry Bureau are fuzzy. In the management of high-tech zones and tourism projects, the boundaries of duties such as the Bureau of Housing and Urban-Rural Development, the Bureau of Culture, Press, Publication, Radio, Film and Television, the Tourism Bureau, and the Economic and Information Bureau are blurred.

2.1.2 The imperfectness of responsibility of spatial governance in towns and townships. The streamline administration and institute decentralization reform in towns and townships of Sihui is in the policy exploration period, and the system reform needs further improvement. At present, their spatial governance responsibilities are not perfect, and detailed descriptions are as follows: ① Dongcheng Subdistrict, Chengzhong Subdistrict, and Zhenshan Subdistrict, located in the city area, are mainly responsible for the implementation of county-level planning policies; ② the spatial governance responsibility of Dasha Town is similar to those of 3 subdisrticts, but simpler; ③ the spatial governance responsibility of Jianggu Town as an important source of water supply is characterized by water source protection and commercial operation; ④ the responsibility of spatial governance in Jingkou Town highlights the characteristics of land acquisition and demolition; ⑤ the spatial governance responsibilities of Huangtian Town, Xiamao Town, Weizheng Town, Didou Town, and Shigou Town take into account the construction of towns and townships and the "renovation of old villages, towns, and factories"; ⑥ Luoyuan Town and Longfu Town have the simplest responsibility for spatial governance, mainly refering to publicize planning policies. In addition, the lack of planning and technical personnel in the village-town spatial governance institutions has caused a gap in the county-town and township spatial governance responsibilities.

2.1.3 The particularity of spatial governance in the countryside. Sihui is a county-level city, connecting cities and townships, and the spatial governance in the countryside has special characteristics. First of all, the spatial governance entities in the "village" area include not only state institutions (such as township governments), but village self-governing organizations such as village committees and village groups. The Constitution stipulates that township governments have no right to interfere in rural autonomy. Secondly, the land in countryside is mostly collectively owned, and the period of use of the house site is not clear; and the state still lacks a complete legal system for collective land management, development, and circulation, which makes the development of collective land difficult. Thirdly, the countryside that is in short supply of finance lacks financial support for planning and implementation.

2.2 The difficulty of coordinating spatial governance elements

The difficulty of coordinating the elements of "a blueprint" in Sihui is reflected in the following aspects. ① Inconsistence between basic data standards. There are many kinds of data such as population data sources and their statistical calibers, forecasting methods of construction land scale, planning base maps, spatial information handling techniques, and socio-economic data. ② Differences in the emphasis of different plans. To be specific, the national economic and social development plan attaches importance to the implementation of projects, the urban plan pays attention to the development of construction land, the land plan emphasizes the protection of farmland, the forestry plan values the protection of public welfare forests, the environmental protection plan takes ecological environment restoration and pollution prevention seriously, and the water source protection plan stresses the protection of water sources. ③ Differences in the planning period. The national economic and social development plan is usually 5 years, the land plan is generally 10–15 years, the long-term urban plan is 20 years, the medium-term urban plan is 10 years, and the short-term urban plan is 5 years. ④ Differences in land use classification. The size of urban and rural construction land, the connotation of regional public service land, and special land and water land in the urban plan is different from that in the land plan. ⑤ Differences in space control. The four major plans have different zoning bases, different zoning compositions, and different space control requirements.

2.3 Contradiction in the implementation mechanism

In general, county plans are mostly implementation-oriented. Due to the unclear rights and responsibilities of the spatial governance entities of Sihui, the lack of a coordination mechanism, the contradiction between the protection elements and the development elements of a blueprint is prominent. Under the circumstances of the division of powers or authority of office on project approval, the effectiveness of the implementation of projects is affected. In the course of the implementation of the project, project approval is in accordance with the national economic and social development plan, but the construction land plan and land examination approval are in the light of the urban plan and the land plan. Due to the lack of coordination between the urban plan and the land plan, especially the inconsistency in the technical language, there are differences in the planning of construction land. Besides, the two plans are both statutory, and their revision

process is complicated, which makes the project difficult to reach.

3 Spatial governance paths of multi–plan integration in Sihui

3.1 Reconstructing the relationship between spatial governance entities

3.1.1 Preparation of organizational construction. Sihui has set up a leading group led by the city leaders, in which multiple departments participated in. It has a normalization work leading group and a Multi-plan Integration Office, which is responsible for the preparation of multi-plan integration (Fig.1). In addition, multi-disciplinary expert consultants have been hired to be responsible for technical consulting. Sihui has signed a planning technical service agreement with the Guangdong Urban & Rural Planning and Design Institute, the Guangdong Land Survey Planning Institute, and an Intelligent Exploration Technology company in Guangzhou to form a technical consortium, which is responsible for various research projects. It has also set up special groups, such as industrial group, space group, ecological group, village-town group, and land plan group, which are responsible for on-the-spot investigation of the allocation of land development rights and cooperating with the research unit for plan preparation.

3.1.2 Implementation organization and system construction. Sihui has upgraded the "Urban and Rural Planning Committee" to "Sihui Municipal Planning Committee" and integrated the responsibilities of the Multi-plan Integration Office. The Sihui Planning Committee has a Space Planning Service Center (referred to as Service Center) and four service departments (Fig.2), which take charge of project approval service, plan result guarantee, and dynamic update and maintenance of the platform database. Moreover, in order to realize the systematic and guaranteed implementation and management of the examination and approval, Sihui has timely formulated supporting laws and regulations, such as the *Detailed Implementation Rules for Urban Growth Boundary Management*, the *Implementation Rules for Ecological Control Line Management*, and the *Implementation Optimization Measures for Project Approval Process Program.*

3.1.3 Right and responsibility design. First of all, the village and town governments have the right to participate in the whole process of governance, and the special group of villages and towns, which is in charge of in-depth investigation of the development appeals of villages and towns, has been set up to effectively coordinate vertical rights and responsibilities. Secondly, the principle of horizontal coordination (Fig.1), which decides on the space by land use and clarifies the powers or authority of office by boundaries, has been established. This has been achieved by clarifying the boundaries of various spatial elements and identifying the competent authorities, as well as timely handling the attributes of various types of differential blocks. For example, the Bureau of Land and Resources takes charge of the basic farmland control line, the Bureau of Development and Reform takes charge of the industrial block control line, the Bureau of Housing and Urban-Rural Development takes charge of the urban scale control line, the Forestry Bureau takes charge of the forestry ecological red line, the Bureau of Environmental

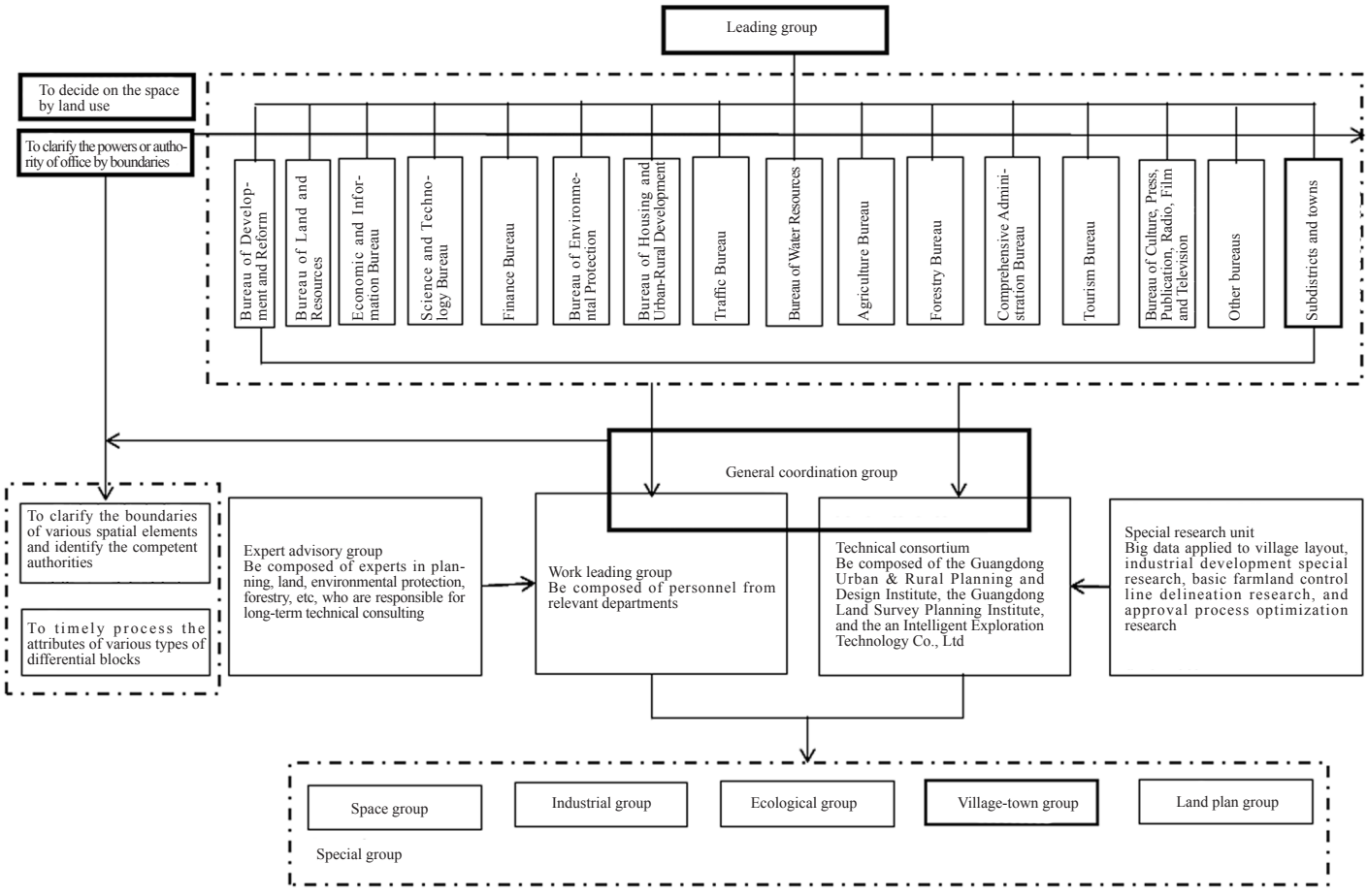

Fig.1 Spatial governance rules of Sihui

Protection takes charge of the water source protection zone control line, the Garden Bureau takes charge of the green line control line, the municipal department takes charge of the yellow line control line, the Bureau of Water Resources takes charge of the blue line control line, and the Bureau of Culture, Press, Publication, Radio, Film and Television takes charge of the purple line control line. For variance land parcels, Sihui has linked the powers or authority of different departments, respect the actual development needs and planning requirements, and negotiate with them specifically (Fig.3). Thirdly, in order to solve the financial problems concerning plan preparation and project implementation, the Finance Bureau and the Economic and Information Bureau have also been included in the governance rules system, which could effectively solving the contradiction between the power or authority over financial affairs. Fourthly, the multi-plan integration work has been advanced through the institutionalized interaction and coordination of the work leading group, expert advisory group, technical consortium, and special group.

3.2 Unifying spatial governance elements

3.2.1 Construction of a shared information platform. The spatial sharing information platform built by Sihui has multifunctional features. In terms of basic functions, it can realize a blueprint intelligent presentation, which can edit, query, browse, mark, and take screenshots of the blueprint. In terms of business collaboration, it can perform many functions, such as project query, project scope introduction, and project scope overlay. In terms of advanced analysis, it can perform a lot of functions, such as control line detection, intelligent site selection, land plan analysis, special plan analysis, regulatory plan analysis, custom query, and custom statistics.

3.2.2 Unification of planning data. Sihui has used the technology platform to collect 182 planning data from 20 departments, and unified the population data and its caliber and scope, land data, socio-economic data, construction land scale prediction method, spatial graphics handling method, space coordinates, etc. There are 6,448 variance land parcels, involving a land area of 20.33 km^2, which has opened up planning data islands to form data consistency.

3.2.3 Unification of goals and deadlines. In terms of targets and indicators, Sihui has coordinated the demands of various departments and formulated 47 core index systems in three categories (Table 1). In the overall development direction of the space, Sihui City has linked up the upper level plan, considered the actual development needs, and established a centralized planning construction area pattern of "double heart and two axes and seven zones" (Fig.4). In the planning period, 2020 has been used as the connection node of each plan in the near future, and 2030 has been used as the long-term connection node of each plan. Among them, the scale of urban and rural construction land for the urban plan in 2020 does not break the upper control limit of 7,968.00 hm^2 of the land plan. In 2030, the scale of urban and rural construction land for the urban plan does not break 10,478.93 hm^2 of the land plan. In addition, the conditional construction area of the land plan has been connected, and 20% of the flexible space has been reserved.

3.2.4 Dovetailing the space management and control system. Sihui has adopted the "anti-planning" path, and controlled the non-construction land to construct a "base map" for land expansion, and delineated the ecological control line and the urban growth boundary control line. Among them, the urban growth boundary is divided into the elastic boundary and the rigid boundary according to the development needs. On this basis, the control line system of the Forestry Bureau and the Bureau of Water Resources within the "domain" is connected (Fig.5). Among them, various types of control lines, including urban development boundaries, ecological protection red lines, permanent basic farmland protection lines, and urban purple lines, departmental special plans and lower-level plans must be strictly implemented, and may not be modified without authorization. For the elements of flexible management and control, such as transportation, public service, municipal and other factors that require "delimitation", "quantification", and "positioning", they have been implemented and refined through the departmental special plans and the lower-level plans (not limited to the determined work content), allowing to optimize and adjust their specific numbers, locations, and boundaries.

3.3 Reconstructing a plan implementation mechanism

3.3.1 Reconstruction of the transmission mechanism of spatial planning system. On the basis of multi-plan integration coordination, Sihui has taken the urban-rural master plan (referred to as "master plan") as the guide, and effectively promotes the transmission of the master plan to the special plan through the planning of the district and development unit. Additionally, with the help of the spatial information platform, the transmission of the plan to implementation is achieved (Fig.6). First of all, the master plan has determined the strategic goal of "a blueprint" and built a global (urban and rural) development pattern,

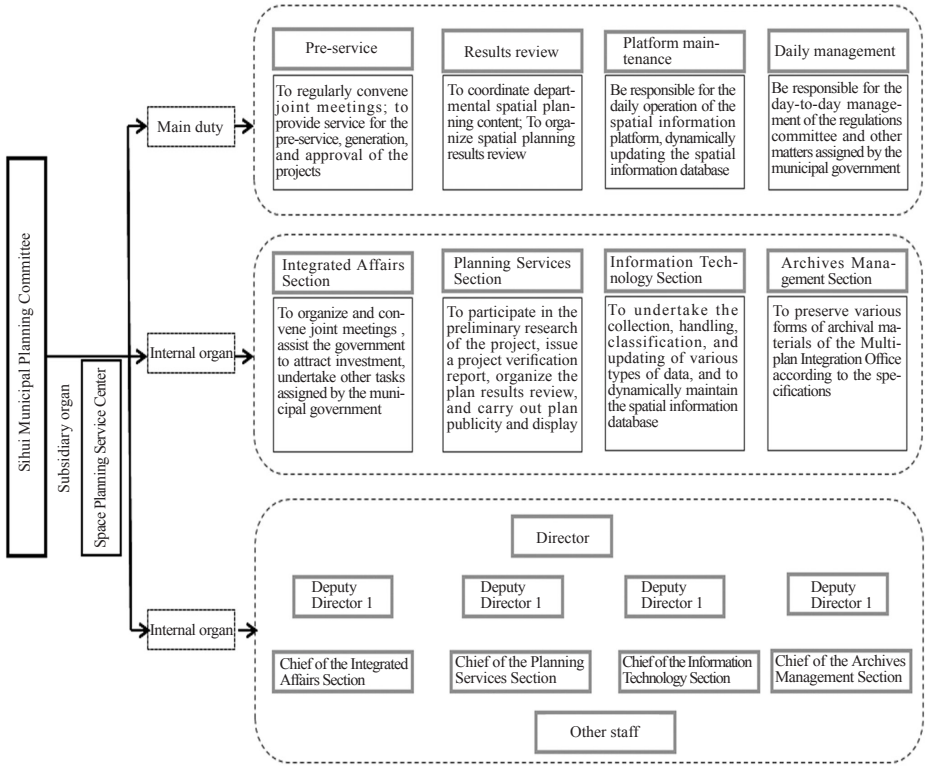

Fig.2 The structure and function of Sihui Municipal Planning Committee

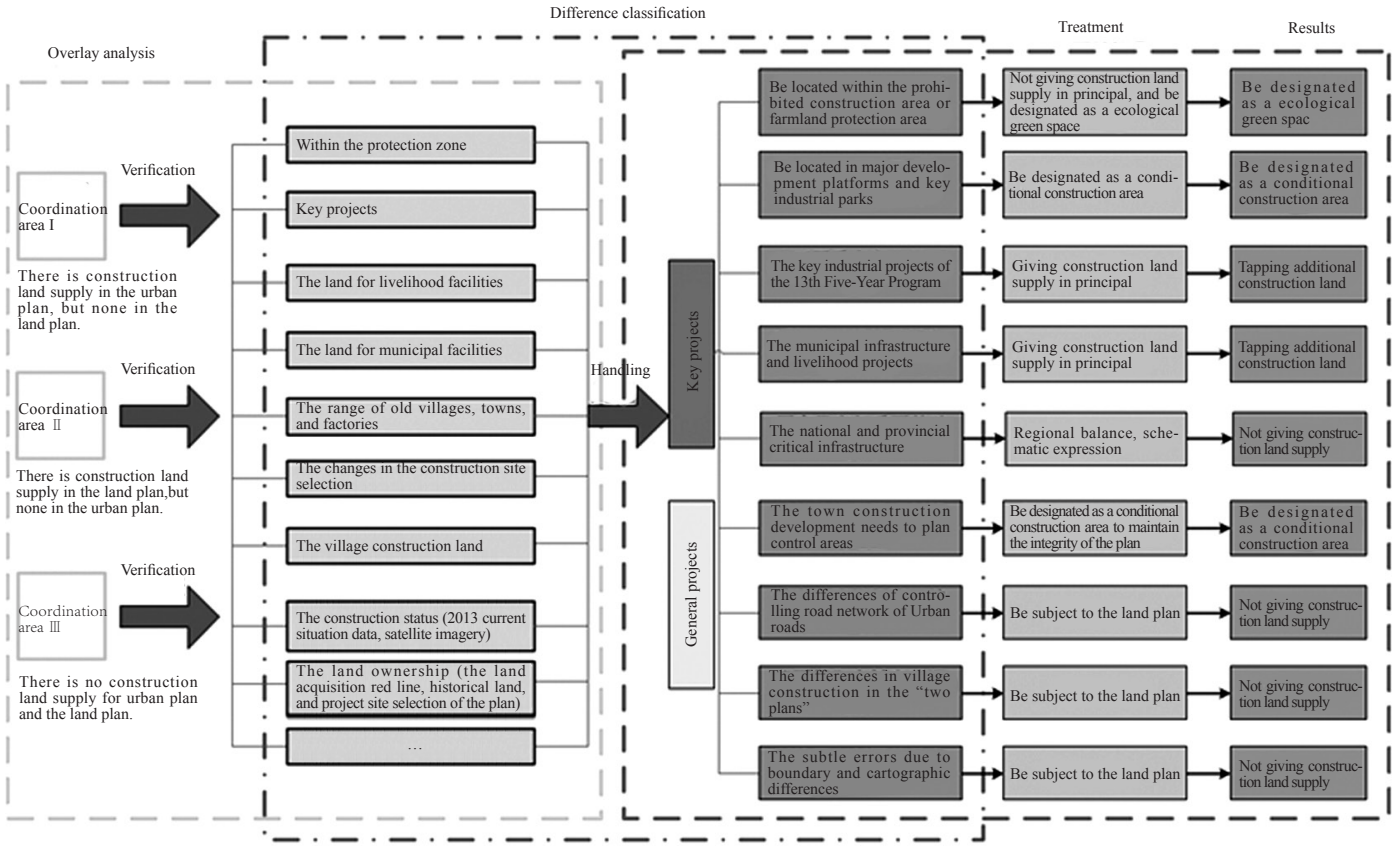

Fig.3 Handling variance land parcels in Sihui

Table 1 Targets and indicators for the comprehensive plan of Sihui

Category	No.	Name	Attribute	Executive agency
Vigorous Sihui with sustainable economic development and simultaneous advancement in four modernizations	1	Per capita GDP//yuan	Guided	Bureau of Development and Reform
	2	Accumulated new jobs in cities and towns//10,000 people	Guided	Bureau of Development and Reform
	3	Urbanization rate//%	Guided	Bureau of Development and Reform
	4	Permanent population at the end of the year//10,000 people	Guided	Bureau of Development and Reform
	5	Urban registered unemployment rate//%	Guided	Bureau of Development and Reform
	6	Proportion of three industries//%	Guided	Bureau of Development and Reform, Economic and Information Bureau
	7	Proportion of the added value of high-tech industries in GDP//%	Guided	Bureau of Development and Reform, Economic and Information Bureau
	8	Proportion of R&D in GDP//%	Guided	Bureau of Development and Reform, Economic and Information Bureau
	9	Number of authorized patents//a /10,000 people	Guided	Bureau of Development and Reform, Bureau of Technology
	10	Per capita income of employees on the job//yuan	Guided	Bureau of Development and Reform
	11	Per capita net income of farmers//yuan	Guided	Bureau of Development and Reform
	12	Gross enrollment rate in high schools//%	Guided	Bureau of Development and Reform, Bureau of Education
	13	Gross enrollment rate of higher education for the age-appropriate population//%	Guided	Bureau of Development and Reform, Bureau of Education
	14	New rural cooperative medical coverage//%	Guided	Bureau of Development and Reform, Public Health Bureau
	15	Urban basic medical insurance participation rate//%	Guided	Bureau of Development and Reform, Public Health Bureau

To be continued

Continued form Table 1

Category	No.	Name	Attribute	Executive agency
Efficient Sihui with an orderly spatial layout and reasonable resource allocation	16	Urban per capita construction land//m^2	Mandatory	Planning Bureau
	17	Per capita land use of rural settlements//m^2	Mandatory	Planning Bureau
	18	Scale of urban and rural construction land//km^2	Mandatory	Bureau of Land and Resources, Planning Bureau
	19	Basic farmland inventories//hm^2	Mandatory	Bureau of Land and Resources
	20	Inventories of national and local ecological public welfare forests//hm^2	Mandatory	Forestry Bureau
	21	Control area of primary and secondary water source protection areas//hm^2	Mandatory	Bureau of Environmental Protection
	22	Per capita area of land for cultural facilities//m^2	Mandatory	Planning Bureau
	23	Per capita area of land for education research facilities//m^2	Mandatory	Planning Bureau
	24	Per capita area of land for sports facilities//m^2	Mandatory	Planning Bureau
	25	Per capita area of land for medical facilities//m^2	Mandatory	Public Health Bureau
	26	The number of medical beds per 1,000 people//bed	Mandatory	Public Health Bureau
	27	Per capita area of land for social welfare facilities//m^2	Mandatory	Bureau of Civil Affairs
	28	Network density of main roads/secondary roads/branchs//km/km^2	Mandatory	Traffic Bureau
	29	Time to reach the core city of Pearl River Delta from Sihui//min	Guided	Traffic Bureau
	30	Time to reach the peripheral towns from Sihui//min	Guided	Traffic Bureau
Beautiful Sihui with beautiful ecological environment and cultural characteristics	31	Proportion of urban, agricultural, and ecological spaces//%	Mandatory	Planning Bureau, Bureau of Land and Resources
	32	Proportion of land used for control of ecological control lines to the city land//%	Mandatory	Planning Bureau
	33	Proportion of the area of urban development boundaries to the area of urban land//%	Mandatory	Planning Bureau
	34	Urban forest coverage rate//%	Mandatory	Forestry Bureau
	35	Urban per capita park green area//m^2	Mandatory	Planning Bureau, Forestry Bureau
	36	Number of city parks above city level//a	Mandatory	Planning Bureau, Garden Bureau
	37	Number of forest parks, nature reserves, wetland parks//a	Mandatory	Forestry Bureau
	38	Greening rate of urban built-up areas//%	Mandatory	Forestry Bureau
	39	Comprehensive energy consumption per unit of GDP//1 ton of standard coal/10,000 yuan	Mandatory	Bureau of Environmental Protection
	40	Reduced total emissions of major pollutants//%	Mandatory	Bureau of Environmental Protection
	41	Urban waste innocuous treatment rate//%	Mandatory	Bureau of Environmental Protection
	42	Urban sewage treatment rate//%	Mandatory	Bureau of Environmental Protection
	43	Comprehensive utilization rate of industrial solid waste//%	Mandatory	Bureau of Environmental Protection
	44	Water quality standard-reaching rate of centralized drinking water sources//%	Mandatory	Bureau of Environmental Protection
	45	Registered non-removable culture "Four Haves" ratio//%	Mandatory	Bureau of Culture, Press, Publication, Radio, Film and Television
	46	Average number of tourists per year//10,000 people	Guided	Tourism Bureau
	47	Total tourism revenue//100 million yuan	Guided	Tourism Bureau

and the legal status of the master plan has been determined through the approval of the Municipal People's Congress. Secondly, the county area is divided into 9 large districts, and the plan guidelines for the districts are formulated. At the same time, considering the existing management and control division, administrative boundaries, main traffic trunks and natural boundaries, the urban centralized construction area is divided into 24 development units to coordinate spatial elements such as park green space, public service facilities, and municipal infrastructure. Thirdly, according to the boundary of the powers or authority of office, special plans (based on the basis of "a blueprint")for multiple departments have been prepared to comprehensively link the elements of industry, population, public

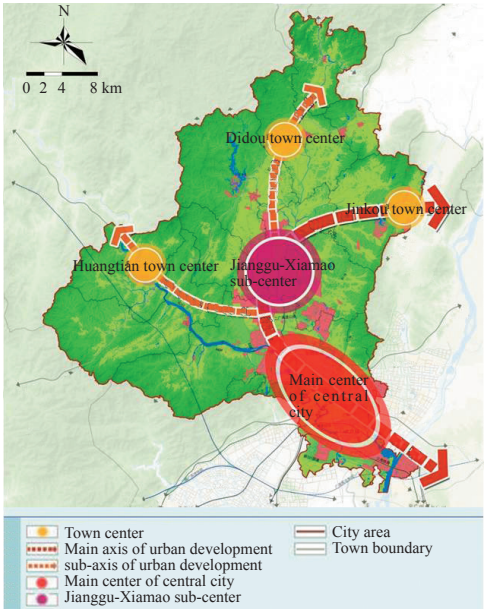

Fig.4 Spatial development pattern of Sihui

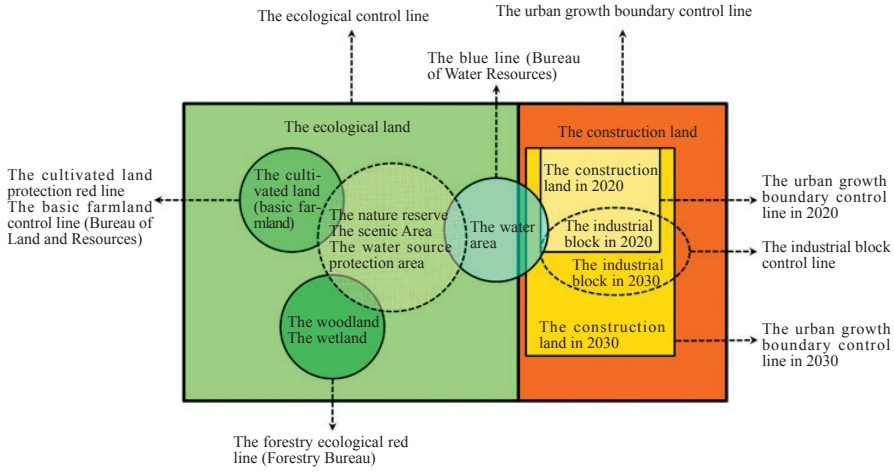

Fig.5 Space control line of Sihui

services, infrastructure, ecology, and agricultural layout. Finally, based on the recent construction, the business collaboration function of the information platform has been employed to promote the completion of projects.

3.3.2 Implementation of project parallel approval. In the pre-approval link, the service center has taken the lead in soliciting opinions for the project approval and land use approval, and done a good job in the preliminary review. When it comes to plan linkage modification, the spatial information platform can be used to timely promote the linkage modification of statutory plans such as the urban and rural master plan, near-term construction plan, overall land use plan, and forestry protection plan (Fig.7). In the formal approval process, the project approval is led by the Bureau of Development and Reform, the land use approval is led by the Bureau of Land and Resources, the completion of the project is led by the Bureau of Housing and Urban-Rural Development to form a mechanism that is coordinated by only one unit in each link, improving the efficiency of administrative services.

3.3.3 Establishment of a dynamic assessment adjustment mechanism. Sihui has established a plan dynamic evaluation and adjustment mechanism, which regards the annual monitoring and special evaluation in key areas and the five-year comprehensive evaluation as the core evaluation method. Through the tracking and feedback on the implementation and key indicators of population, land, ecology, and safety, the plan revision or plan dynamic adjustment, which is based on the evaluation results, is performed to guide the implementation of the recent construction plan and annual implementation plan, with an effort to realize the implementation or adjustment of the master plan and enhance its ability to adapt to urban development and changes.

4 Conclusion

From the perspective of spatial governance, this paper analyzed and summarized the contradiction and reform experience of Sihui in multi-plan integration, and discussed the problem of spatial governance in the county area. As China's multi-plan integration pilot

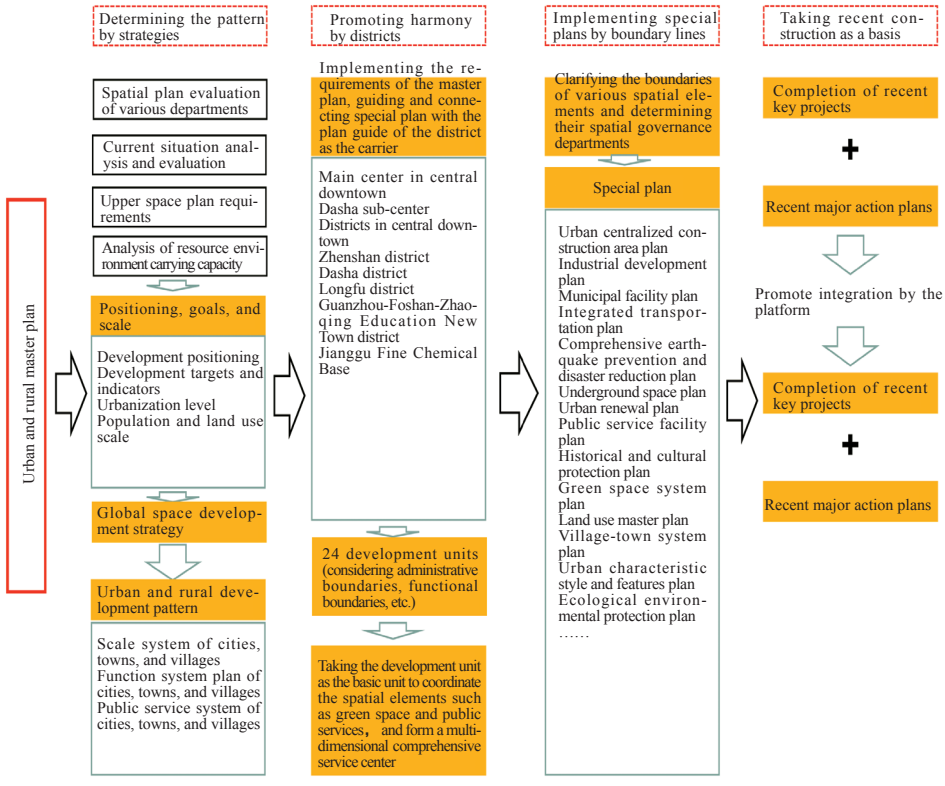

Fig.6 The transmission mechanism of the spatial planning system of Sihui

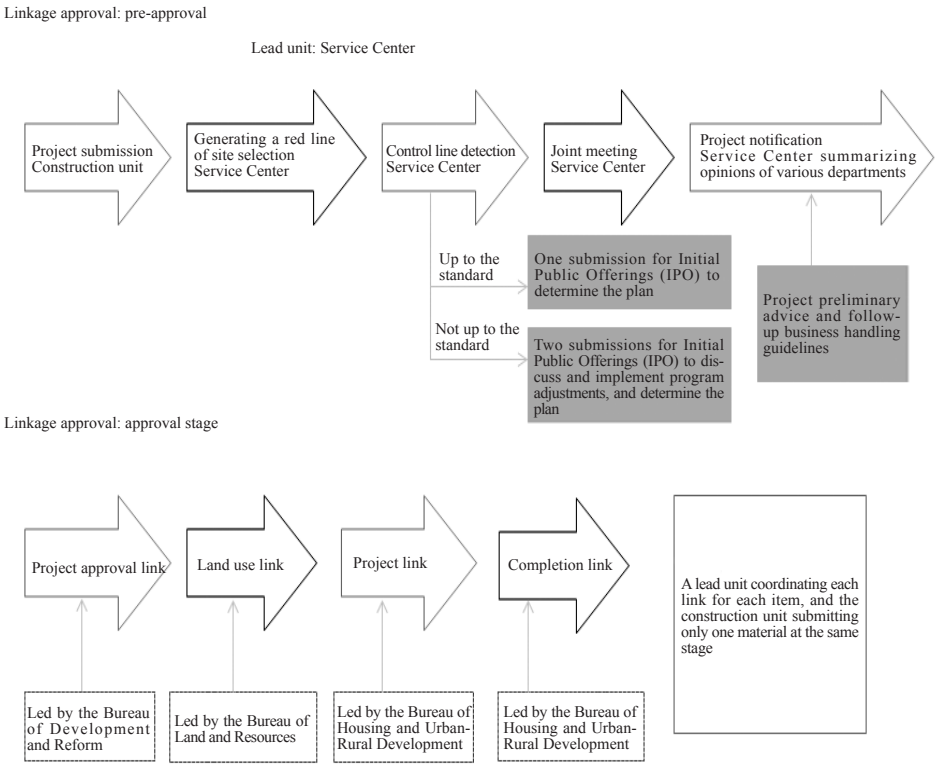

Fig.7 Project Approval Mechanism of Sihui

has developed from cities and counties to the provincial area, the reform experience has yet to be comprehensive and multi-dimensional summary and analysis. Therefore, applying spatial governance theory to the study of the right or responsibility mechanism of multi-plan integration at different spatial scales can be an important research direction.

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