Practice about Definitions of three boundaries in Chinese spatial planning

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Summary: This paper reviews the spatial development of, as well as, spatial planning and development of, China’s national territory and, based on which, puts forward the development strategy of China’s spatial planning in the new period. This paper also, by a combination of the exploration of spatial planning carried out in China’s city and county levels, makes an analysis in the practical applications of permanent basic farmland, the red line of ecological protection and the boundary of urban development in the spatial planning, and in the technical methods. Meanwhile, this paper sums up the main consensuses about the spatial planning and puts forward policy suggestions about further development and perfection.

摘要：在回顾中国国土空间开发和空间规划发展的基础上，提出了新时期中国空间规划的发展战略。结合中国市县层面开展的空间规划的探索，分析了永久基本农田、生态保护红线和城市开发边界在空间规划中的实践应用和技术方法，总结了空间规划的主要共识，并对进一步的发展完善提出政策建议。
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1. Basics of Spatial Planning
1.1 Spatial Development Features and Problems

China has a vast territory, but with huge regional differences. From the southeast coasts to the west inland, prominent differences in the water and thermal conditions in different spaces are seen. China also owns abundant resources of all kinds in total, but insufficient per capita. Meanwhile, there are diverse ecological types in China, however, due to complex factors, a large area of ecology is fragile. Since the reform and opening-up, China’s spatial development has shown a series of prominent features:

1.1.1 Populations are moving towards eastern costs and large cities, but there is a lack of overall planning in spatial development.

Since the reform and opening-up, China has entered into a rapid urbanization development stage, the urbanization ratio increased rapidly to 53.73% in 2013 from 29.04 in 1995, and there have been a prominent trend of the populations being moving to the coastal areas, areas along rivers and areas near the traffic lines and boundary lines. However, there are no changes in the basic features of the spatial distribution of populations fundamentally. Overall, a spatial feature is still maintained that there are dense populations along the southeast side of Hu Line and sparse populations in its northwest. Rapid industrialization and large-scale spatial development brings a huge pressure to China’s resource environments. There still are many issues existing in the construction of China’s spatial development, planning and coordination, spatial control, and etc..

1.1.2 The development of regional economy is featured with multi polarity while there are prominent imbalanced spatial development issues.

China’s economy keeps growing rapidly, with an annual average growth rate of 10%. With the in-depth advancement of overall regional development strategy, the pace of development in central and western regions is accelerated significantly, while the national economy growth pattern tends to be multi-polaritized. Although the relative gaps between regional development are narrowed, the absolute gaps remain enlarging. Moreover, as to public capital investment, basic education, medical and health investment, social security and etc., there are significant differences between urban and rural areas of different provinces and cities.

1.1.3 The development workloads keep increasing, while the spatial utilization efficiency is low.

The rapid economy growth has led to rapid consumption of resources and energy, ecological environment destruction, causing increasing prominent contradictions between economy development and resource guarantee. The high quality cultivated
land area is decreasing year by year while the wetland area is shrinking, having significant negative impacts on the ecological environments.

1.1.4 In some areas, the resource environments are overloaded thus, the spatial development is restricted.

Due to the extensive development mode, in some areas, there are prominent security issues as to water resource. Meanwhile, the main pollutant emissions exceed the environmental capacity. Moreover, in the whole country, the geological, seismic, meteorological and marine disasters occur frequently. Thus disaster prevention and mitigation capacity and emergency response capacity need to be improved.

1.2 Spatial Planning Features and Issues

China’s basic national conditions and institutional features decide the diversification of internal composition of the spatial planning system[7]. There are at least 83 kinds of planning prepared by authorization of laws. The spatial planning system has the features in the following three aspects. First, there are many parallel plannings. The subjects of all of the existing kinds of spatial plannings are mainly the governments at all levels or the functional departments. Of which, there are 6 kinds of planning - economic and social development planning, main function zone planning, territorial planning, land use planning, urban and rural planning, environmental protection planning - which play a leading role in China’s social and economic development, resource distribution optimization and resource protection, and many other aspects. Second, clear hierarchy. Each kind of spatial planning is basically carried out by the administration departments at the corresponding levels. For example, a five-level planning system has been constructed for the overall land use planning. They are respectively overall land use planning at national level, provincial level, municipal level, county level and township level. Thirdly, a combination of guidance and restriction. In all kinds of planning, for different control indicators, anticipatory guidance measures and restrictive control means are developed respectively.

Being impacted by the value orientation, department interests, professional restrictions, poor communication and many other factors, as to China’s spatial planning, unclear planning functions, contradictions in planning contents, waste of planning resources and other phenomenons emerge, affecting the planning efficiency. There are two reasons. First, the spatial control thinking, which needs to be reformed, is restricted to by the customary thoughts of planned economy for a long time[8]. Second, there are insufficient basic researches on the spatial planning systems. The monitoring and early warning of resources and environment carrying capacity needs to be further strengthened as to researches on it for its popularization and application. Third, the administrative systems are not coordinate. The division by all departments of planning restricts the implementation effect of spatial planning[9]. Fourth, the law systems about the spatial planning are to be perfected. And there is a lack of support by special laws[10]. Thus, there is an urgent need to make a definition of the production, living and ecology spatial boundaries centered on the construction of spatial planning systems in accordance with the requirements of greatly advancing the ecological civilization construction by the central government.
2. Strategic Orientation of the Spatial Planning

2.1 We need to adhere to both the governments regulation and market regulations.

Give full play to the role of the government in guidance and control as to the spatial
development and utilization, and comprehensively apply planning, policy and law and
other means to scientifically guide the population mobility, urban and rural
construction and industrial layout, control the development strength, adjust the spatial
structure and promote focused development and balanced development. Based on this,
we need to actively perfect the market economy system to give play to the basic role
of the market in the resource allocation, to a greater degree and in a wider range, to
improve the efficiency of resource allocation and spatial development.

2.2 We need to adhere to the national territory development matching with the
carrying capacity.

We need to build up an ecological civilization concept to respect the nature, comply
with the nature and protect the nature to scientifically develop and utilize the national
territory in the premise of not exceeding the resource environment carrying capacity.
We need to, according the nature of the resource, ecological conditions and
environmental capacity, make clear the limitation and suitability of the spatial
development, guide the mobility of the populations and the industries towards the
regions with a relative high resource environment carrying capacity, optimize the
production, living and ecology spatial structures and promote the coordination
between the populations and the resource environments.

2.3 We need to adhere to the coordination between the agglomeration
development development and the balanced development.

We also need to focus on the spatial agglomeration development, encourage to let
the regions with the conditions develop first, give a maximum play to the
agglomeration benefits of all kinds of the factors, and improve the ability to drive the
surrounded regions to develop. Moreover, we need to take into account the efficiency
and fairness, make overall allocation of public resources, promote the equal exchange
of elements and advance the coordinated urban and rural development in all regions.
Also, we need to make great efforts to give support to the old revolutionary base areas,
minority concentrated areas, border areas, poor areas and resource - exhausted cities,
and improve self-development abilities. In addition, construction of public welfare
infrastructure and environmental protection infrastructure should be advanced for the
priority guarantee for the spatial construction of public education, medical and health,
employment service, social security, the aged service and other many livelihood
facilities to advance the equalization of the basic public services.

2.4 We need to adhere to the dependent promotion between the development and
the protection of the development in a wider range.

We also need to adhere to the development and protection of the development for
further development. In the regions with a relative high resource environment
carrying capacity, we need to implement centralized layout and stronghold
development, and fully improve the utilization efficiency of the limited space for
development, to create more space and to be much more stronger for national territory
protection in a greater range and at a higher level. The protection themes should be cleared according to the spatial development features of different areas to implement classified protection.

3. Key Contents of Spatial Planning

Based on the references to the international spatial planning experiences and summaries of China’s spatial planning practices at city and county levels, the spatial planning that is being carried out in China is mainly to definite the red line of ecological protection, the red line of permanent basic farmland, and the boundary of urban development to form ecological spaces, agricultural spaces and urban spaces so as to implement spatial guidance and control.

3.1 Red Line of Permanent Basic Farmland

3.1.1 Definition method based on the quantity and spatial layout.

In most researchers, based on the grading of the agricultural land, indicators which have impacts on the farm land to a high degree, were selected to predict the grain demand quantity\(^3\), based on the basic farmland’s slope, evenness, soil texture, soil fertility, connectivity, irrigation facility and many other natural conditions of the cultivated land\(^{1-2}\) and by population size, grain demand per capita, multi-cropping index, proportion of sown area of grain crops and other basic parameters, and to predict the available supply quantity of the cultivated land by productivity calculation of agricultural land\(^4\), to conduct supply-demand equilibrium analysis to determine the final basic farmland quantity. Based on this, some scholars introduced landscape fragmentation index and modified K mean spatial clustering method to obtain the spatial layout of the basic farmland\(^5\). This method lacks a consideration of the spatial location of the plots, often causing the basic farmlands located at the regions with highest potential land use conflict risk and biggest conflicts between land use purposes (such as, suburbs and areas along the transaction lines), thus, resulting in high protection costs of the basic farmlands in some areas but with poor effect achieved\(^6\).

3.1.2 Definition method based on the quality and spatial layout.

This method is mainly used to definite the basic farmlands respectively based on the agricultural land’s quality grade, utilization grade and economy grade. Then, an analysis is made on distance from the so defined basic farmland to the cities, residential areas and roads, as well as on the adaptability of the so defined basic
farmland to the adjacent land, so as to select the more suitable cultivated land to be the basic farmlands and thus, determine the spatial layout\textsuperscript{[8,9]}. As to the basic farmlands defined by the natural quality grade and utilization grade of the agricultural land, more rational spatial distribution of the plots is got.

3.1.3 The method based on the spatial technologies.

As to the basic farmlands at county level, information construction and dynamic monitoring is conducted based on the quantity of the basic farmland, the soil quality and the ecological environment quality, and used to the definition of the permanent basic farmland and refined monitoring management\textsuperscript{[11-12]}. With the development and extensive application of “3S” technologies, a big breakthrough and innovation is achieved as to the researches on basic farmland protection both in theory and technical method, which researches on the basic farmlands are conducted via a combination of traditional theory evaluation methods and modern scientific technologies.

3.1.4 Statistical measurement and analysis method.

It is more common to use statistical analysis methods and measurement analysis means to describe the land use status, carry out comprehensive evaluation of the cultivated land quality, build up the evaluation indicator system of selecting the cultivated lands to be the basic farmlands, explore the factors that hinder the definition of the basic farmlands. Of which, the mean, median, mode, variance, skewness, frequency and many other descriptive analyses are usually used to get the property data of the basic farmland for preliminary statistical analysis. In summary, as to the basic farmland definition, the basic farmland quantity determination is mainly conducted from the perspectives of the agricultural land grade and cultivated land evaluation. As to the theory researches on spatial layout definition methods and practice attempts, a big breakthrough and innovation in theory and technology has been achieved, which gradually spurs the basic farmlands to be protected in both the quantity and the quality simultaneously, not only in the quantity as before. In the actual definition of the basic farmland, it is very hard to achieve the definition by a single method. To achieve a rational and scientific definition, a combination of using two or more methods is needed. Based on the analysis of the property data of the basic farmland via the statistical measurement analysis method, a definition task can be completed by applying computer software via 3S technology. When using the mode method, a definition task of the basic farmlands also can be completed based on the agricultural land’s grading principles and by building up an evaluation indicator system via GIS software.

3.2 Boundary of Urban Development

3.2.1 Definition based on the natural geographically limited elements.

There are three kinds of technologies. The first kind is the land use adaptability evaluation technology, which is applied to conduct researches on whether the land is adaptable to the intended use, the adaptability degree and the limitation situations in accordance with the natural, social and economic properties of the land. The second kind is the urban growth resistance analysis technology, which is applied to quantify the indicators and ranges of all kinds of natural and geographical elements on the
basis of the comprehensive evaluation and development analysis of the natural and geographical elements, thus, forming a range to be avoided for the needs for urban development. The third kind is the urban carrying capacity evaluation technology, which is applied for grading the carrying capacity of all plots evaluated, and selecting the regions with a relatively high carrying capacity to be the regions for urban limited development and thus defining the UGB.

3.2.2 Definition based on the relevant protection requirements.

There are three methods. The first method is relevant protection range superposition method, which is applied for comprehensive superposition of the urban landscape protection area, forest protection area, water source protection area, basic farmland protection area and other elements to form UGB. The second method is four-zone definition method, which is applied as per its defined requirements by China’s law and regulation system to define UGB. The third method is the ecological safety pattern method, which is used to first determine the urban resource control range during the urban planning process as guided by the ecology thoughts to define the major natural systems on which the urban sustainable development relies, as the land not for construction purpose, thus, define UGB.

3.2.3 Definition based on the spatial development forecast.

There are two methods. The first method is urban spatial expansion modeling method, which is, based on the historical development laws, applied to establish the urban spatial expansion models in all directions, to define UGB ranges in all directions by combining the basic judgments about its future development, to form a UGB within a certain period. The second method is the urban spatial development simulation method, which is applied to develop UGB methods based on the constrained cellular automata (CA model).

3.3 Red Line of Ecological Protection

3.3.1 Definition based on the natural and geographical limited elements.

There are two methods. The first method is the environmental carrying capacity evaluation method, which is applied for grading the carrying capacity of all plots evaluated, and selecting the regions with a relatively low carrying capacity to be the regions limited for development and thus defining the red line of ecological protection. The second method is the natural boundary method, which is applied for getting the boundary points by using Jenk optimization method in the statistics based on GIS[^13].

3.3.2 Definition based on relevant protection requirements.

There are two methods. The first method is relevant protection range superposition method, which is applied for comprehensive superposition of the importance of the ecological functions, ecological environment sensitivity, ecological protection diversity and many other elements to form the red line area of the ecological protection. The second method is adaptability of ecological factors evaluation method, which is applied for quantitative calculation of all factors that have an impact on the stability of the regional ecological functions and making an intuitive analysis on the impact degree of all factors, as well as, making an comprehensive assessment of the service functions of the ecological systems by using weighted method.

4 Experiences from Practices
Chinese governments have carried out “multi-planning united” plans at national level in 28 cities and counties in the whole China. Some provinces also chose typical regions to carry out relevant practical work. For more than two years, multi-planning united work has flourished and consensuses have been reached in many aspects.

4.1 Unified Targets and Indicators

The core indicators of the economic and social development planning include GDP per capita, proportion of productive service industry’s added values in the service industry, R&D cost proportion in GDP, private investment proportion in the fixed asset investment of the whole society, the number of the pension beds for each one thousand aged people, hospitalization reimbursement percentage of urban and rural residents cooperative medical insurance, the average annual new urban jobs, and etc.. The core indicators of urban and rural planning include the urbanization rate, the resident population of in urban areas, the scale of urban construction land, greenbelt proportion in urban construction land, and etc.. The core indicators of ecological environment protection planning include total emissions of chemical oxygen demand, total emissions of carbon dioxide, proportion of four or above waters from the major rivers sections, urban sewage treatment rate. The core indicators of the overall land use planning include: the retaining amount of cultivated land, basic farmland protection area, new construction land scale, the total amount of construction land, urban and rural construction land scale, urban industrial and mining land area per capita, and etc.

4.2 About Unified Spatial Layout

As to the comprehensive spatial planning of national territory at county level, urban space, industrial space, comprehensive transportation, ecological space and other national territory use strategies and targets shall be integrated to construct an spatial pattern of overall national territory use and protection at county level. Under the guidance of the overall national territory use layout framework at county level, such contents as urban system structure, industrial spatial layout, comprehensive transportation layout and ecological spatial layout have been proposed at county level.

4.3 About Unified Zoning Control

As to the comprehensive spatial planning of national territory at county level, the economy, resource and environmental elements at county level shall, as guided by the overall spatial layout of national territory at county level, be combined to propose a preliminary program of definition of the boundary of urban development, the red line of ecological protection, and the red line of permanent basic farmland protection. Based on so proposed program, the administrative jurisdiction areas at county level shall be further defined into spatial use zoning of national territory, such as, central city optimization zone, construction zone for major towns, central towns and general towns construction zones, basic farmland protection zone, general agricultural use land zone, ecological protection zone, ecological coordination zone, ecological tourism zone, and etc. and corresponding use zoning control measures and requirements shall be developed.

4.4 About Unified Short Term and Long Term
At present, the “multi-planning united” pilot planning at city level and county level is ended at 2030 in the long term and at 2020 in the short term. In consideration of the existing overall land use planning, and the thirteenth five-year planning for national economic and social development are ended at 2020, all project arrangement and land use indicators shall be practically carried out till 2020 for an outlook till 2030. Here is an specific example at county level below:

(1) The overall spatial targets of national territory shall include 2020 target and 2030 target, of which, the 2020 target of land use shall be linked to the existing overall land use planning, with no breakthrough in total quantity indicators, and with a focus on the structure adjustment. The 2020 urban construction, resource and energy utilization, ecological environment protection and many other targets shall be respectively linked to the existing urban and rural planning (the planning period end at 2020), and the thirteenth five-year planning for national economic and social development.

(2) The 2030 overall spatial layout of national territory at county level shall be determined as per the 2030 comprehensive strategies and overall targets of national territory spaces at county level. On this basis, a preliminary program of definition of the 2030 “three lines” shall be proposed to form the spatial use zoning of national territory.

(3) Under the guidance of 2030 spatial use zoning of national territory at county level, a comparison of “multi-planning” land use layout (2020 year) differences shall be conducted at township level to further define 2020 “three lines” and 2030 “three lines” to respectively form 2020 and 2030 national territory use control zoning.

(4) Under the guidance of the overall targets, overall spatial layout of national territory, and the national territory use control zoning as determined by the comprehensive spatial planning of national territory, sub-planning programs of land use, urban and rural construction, comprehensive transportation, industrial space, ecological environment and etc. Shall be formed respectively, including 2020 short term planning program and 2030 long term planning program. Of which, the short term land use planning program shall mainly be a program for giving suggestions to adjust and perfect the existing overall land use planning.

5 Discussion and Thinking

5.1 Suggestions on Planning Preparation System Reforms

5.1.1 Rationalizing the planning preparation system framework.

The comprehensive spatial planning of national territory shall be the unified overall spatial planning centered on by other spatial planning types. The two major systems of economic and social development planning and spatial planning shall be conducted in short term in parallel and integrated in long term. In the urban and rural planning system, the contents of the urban system planning can be included into the comprehensive spatial national territory planning. Also the contents of the overall city and township planning can be included into the comprehensive spatial national territory planning. Under the guidance of the comprehensive spatial national territory planning and comprehensive special planning (including ecological environment protection planning), controlled and detailed planning, constructive detailed planning and etc shall be prepared. In the short-term planning field, the thirteenth five-year
planing for national economic and social development shall be used to be a basis for unified preparation of short time national territory use planning, short-term construction planning and short-term industrial (undertaking) special planning and also for rolling preparation of annual implementation plans and all land use plans.

5.1.2 Carrying out the preparation work of pilots of comprehensive spatial planning of national territory.

At the national and provincial levels, the comprehensive spatial planning of national territory integrates with the overall land use planning, main function zone planning and etc. based on the national territory planning. It is necessary to make further innovations as to the existing national territory planning in the planning positioning, core contents, preparation methods, control means, and many other aspects, and to explore the integration with the national and provincial overall land use planning step by step. At the city, county and country levels, the comprehensive spatial planning of national territory integrates with the overall planning at city, county and township levels based on the overall land use planning. Thus, it is necessary to as soon as possible carry out the preparation work of the pilots of the comprehensive spatial planning of national territory at all levels, via which such pilots, the contents of the planning results, the technical standards and specifications, the planning result approval and application shall be further specified, so as to improve the position of the comprehensive spatial planning of national territory and enhance its effect.

5.1.3. Strengthening the planning at country level.

The country is the most grass-root social unit and the most basic spatial unit. It is also an extension and perfection of the planning at the township level. Especially, “The mountains and waters need to be seen to help us to remember the nostalgia” was proposed at the central urbanization work meeting. And nostalgia needs a spatial carrier. However, what is mainly carried out at country level is the rural planning. Moreover, as to the pilots of the land use planning at country level, there are many problems, such as, it is hard to determine the locations for pilots, country construction offer involves occupation of the basic farmlands, rural planning standards are not perfect, country design means are lacked, key hands are lacked for construction and implementation of rural planning, the farmer housing management responsibilities are not clear. Compared with the planning at township level, the rural planning has more conditions for integrating with all kinds of spatial planning, increasing the economic and social development contents and trying to prepare a comprehensive development planning.

5.2 Suggestions on Planning Management System Reforms

5.2.1 Gradually carrying out planning management agency reforms.

During the planning coordination period, it is suggested to set up “planning affair coordination leadership group” and office. The office can be set up under the function department leading the planning coordination work, mainly responsible for the daily planning organization and coordination work. During the spatial planning integration period, the national territory resource department can be integrated with the urban and rural planning department to set up “national territory resource and urban and rural
planning department” or “spatial planning preparation committee” to be responsible for unifying all spatial planning. During the integration period of the spatial planning with the economic and social development planning, “planning preparation committee” can be set up to be responsible for unifying all planning. And separation of planning preparation and management from supervision can be implemented.

5.2.2 Rationally defining the superior and the equal governments’ routine powers in the planning.

Take the comprehensive spatial planning of national territory as an example. The statutory contents to be defined to the routine powers of the superior governments include: (1) mandatory requirements of preliminary planning; (2) cross-jurisdiction land use functions, facility configuration and resource environment coordination; (3) the nature of the cities; (4) the planning targets; (5) the urban growth boundary, red line of ecological protection, red line of the permanent basic farmland protection; (6) major regional facility layout, major resource environment element protection, public security maintenance, facility supply standards.

In addition to the statutory contents of the superior governments’ routine powers, the equal governments’ routine powers shall also include: (1) urban development strategies; (2) urban functions and layout structures; (3) urban construction land use balance among all regions; (4) spatial function zoning of national territory at municipal level; (5) the overall planning contents that must be implemented by the subordinate governments.

The other non statutory contents to be defined to the equal governments include: (1) urban population policies; (2) urban industrial policies and industrial layout policies; (3) urban spatial policies; (4) urban construction land use policies; (5) other relevant policies: housing, transportation, urban supporting facilities, urban environment, development policies for major sections; (6) short term spatial planning of national territory, etc.

5.2.3 Enriching the planning implementation mechanisms and measures.

On one hand, it is necessary to continue to improve the administrative review and approval, planning permission and many other basic administrative management means, specify the “three lines” management requirements and the control requirements of the national territory use control zoning, and set up “multi-planning united” planning management and administrative review and approval processes to form “multi-planning united” coordination mechanisms for co-research, co-preparation and co-management to improve the administrative management efficiency. On the other hand, it is necessary to greatly enhance the economic, social and technical means for planning implementation, and increase the ability for guarantee for planning implementation. As to the economic means, it is essential to increase the government’s public spending for planning implementation and to promote the planning implementation via public welfare projects, major engineering, financial transfer, taxation tools and many other measures. As to the social means, it is necessary to enhance the planning publicity and consultation services to create a good social atmosphere to act according to the rules and punish all violation acts to reduce the social cost for planning implementation. As to the technical means, it is essential
to enhance the monitoring on any changes in the use of the national territory resources, compare the planning programs, enhance the rolling assessment of the planning implementation progress and efficiency, and adjust the planning at appropriate time for different situations to ensure the planning to be adaptable to the situations and continue to be effective.

5.3 Suggestions on Planning Law System Reforms

5.3.1 Accelerating the development of the principal planning laws.

It is suggested to, based on the existing Several Opinions of the State Council on Strengthening the Preparation Work of the National Economic and Social Development Planning, Urban and Rural Planning Law, and Land Management Law, accelerate the development of Spatial Planning of National Territory Law to be the unified law in respect of the spatial planning so as to rationalize the relationships among all kinds of spatial planning and guide the unifying and integration of the spatial planning. Meanwhile, it is required to, based on the practices as to the integration of the spatial planning with the economic and social development planning, develop Planning Law appropriately to specify the construction of the national planning system framework.

5.3.2 Organizing modifications of relevant laws and regulations.

It is required to, based on the principal planning laws, organize modifications of the Urban and Rural Planning Law, Land Management Law, and Environmental Protection Law, develop Ecological Environmental Protection Planning Law, Forest Land Protection and Use Planning Law, Water Resource Protection and Use Planning Law, Mineral Resource Protection and Use Planning Law and many other industrial laws, as well as Rules for Public Participation in Planning and many other administrative rules.

5.3.3 Strengthening basic research and technical support.

For doing this, there are four ways. Firstly, to set up “multi-planning united” basic data platform, coordinate system, land use classification standards, data sorting and library building standards and etc. Secondly, to carry out “multi-planning united” planning coordination technology researches, including “three lines” and other spatial boundary coordination, construction land use scale, layout and timing coordination; Thirdly, to set up technical method sharing and exchange system, ecology system technologies, low carbon planning method, participation-style planning method that can be co-used in different kinds of planning and can promote cross connection, resource exchange and sharing among multi disciplines. Fourthly, to strengthen the information platform support, on the “multi-planning united” and “one piece of drawing” basis, construct an unified planning information management cooperative platform to achieve data sharing, exchange, update among national territory, planning, development and reform, environmental protection and other departments to provide guarantees for implementation of “three lines” management and national territory use control zoning and effectively dock with the project review and approval processes to improve the scientific and refined levels of administrative management.
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