



# Big Data Application Strategy in the Field of Land Spatial Planning

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**Abstract.** At present, China has fully entered the 14th five year development period. Among them, the 14th Five Year Plan period will continue to deepen reform and further improve the land spatial planning system of all provinces in China, in order to create a scientific, comfortable and green urban and rural spatial pattern. In order to better promote the coordinated development process of land and space planning, provinces, cities and regions should always adhere to the deployment concept of “multi compliance and integration”, extend the application of big data and related information technology, and solve the problems of self-contained planning and information islands in the past. In view of this, based on the development background of “multi compliance and integration”, this paper focuses on the application of big data technology in the field of land spatial planning.

**Keywords:** Land Spatial Planning · Big Data, · Multi Compliance and Integration

## 1 Introduction

In the new era, facing the severe situation caused by resources, environment and coordinated development, China’s government departments take the initiative to base on China’s basic national conditions and the new urban and rural development path with Chinese characteristics, and make scientific deployment for land spatial planning layout and “multi-compliance” development in accordance with the land spatial planning objectives in the new era, so as to achieve China’s long-term sustainable development goals. During this period, in order to create a new modern pattern of harmonious development between man and nature, relevant government departments timely supplemented the shortcomings existing in the development concept of traditional land spatial planning and technology application [4]. Among them, the construction of land and space big data platform with big data “co construction, sharing and sharing” as the core to realize the integrated application of various data resources of various departments has become the mainstream trend of land and space planning and development in the new era. By breaking the situation of isolated information islands in the past, we can alleviate the long-standing problem of separate policies in land and space planning based on other development and construction, and further meet the development requirements of land and space planning under the background of “multi regulation and integration”.

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## **2 Analysis on the Necessity of Applying Big Data in the Field of Land Spatial Planning Under the Background of “Multi Compliance and Integration”**

In the past, the planning contents and standards of the three main types of spatial planning were not unified, and the problems were obvious (the three main types of spatial planning mainly refer to urban and rural spatial planning, land use spatial planning and environmental protection spatial planning). If the above problems are not solved, the problems of self-contained system and data island in various plans will become more and more obvious. When it is serious, it may have a negative impact on China's urban and rural spatial planning and even the development of the national economy. Considering the wide range and complex system of China's land and space, the national government departments have made an overall plan for the construction and optimization of the land and space planning pattern in the new era. Among them, in order to realize the sound and perfect development of urban and rural spatial pattern, the national government departments take the initiative to emphasize the concept of “multiple regulations and one”.

Among them, the concept of “multi compliance and integration” mainly refers to the realization of the objectives of optimizing spatial layout, rational allocation and development and utilization of land resources through the overall optimization and connection of various planning measures, such as urban and rural planning, land use planning, national economic and social development planning, forest land and cultivated land protection, etc. On this basis, relying on big data and other information technology means, integrate and apply all kinds of planning contents and relevant data involved in the field of land and space planning, so as to solve the problems of different departments and non sharing of information resources in the past. It is not difficult to see that introducing the concept of big data technology into the land spatial planning under the background of “multi compliance” can not only promote the smooth development of land spatial planning, but also enhance the management efficiency of government departments, which has important feasibility value [3].

## **3 Application and Practice Analysis of Big Data in the Field of Land Spatial Planning**

As an important guarantee for the high-quality development of land spatial planning, land spatial data resources are an important prerequisite for effectively mastering the regional endowment of land space and carrying out social development activities. In the past, the problem of information island faced by land spatial planning is relatively obvious. In addition, various departments in various fields act in their own ways. There are obvious lag problems in information interaction and sharing. In recent years, with the implementation of the “multi compliance” policy, the field of land spatial planning has paid more attention to the use of big data technology to realize the integration and analysis of massive land spatial data resources. According to the analysis and feedback results, the shortcomings existing in the current land spatial planning work shall be supplemented in time. And through continuous innovation and optimization of land

and resources management and utilization, ensure the sustainable improvement of land and resources management level. Combined with the current application situation, the application practice problems of big data technology in the field of land spatial planning are mainly as follows:

### **3.1 In Depth Analysis of Land Development Intensity and Resource Utilization**

Land planners can rely on big data technology to conduct directional analysis on land use space and spatial statistical data. According to the analysis feedback results, a series of work such as spatial statistics and summary analysis are carried out purposefully. It actively combine the current situation of land use and the overall planning of land use, and focus on the spatial distribution characteristics such as the quantity and intensity of land use in the planning area. On this basis, it provides a good decision-making basis for other qualitative and quantitative work [5].

### **3.2 Realize Geological Disaster Prediction and Management**

The comprehensive supervision department of land and resources can build a scientific and reasonable geological disaster monitoring system based on big data technology. In the process of operation and application, intelligent sensing devices such as Internet of things and sensors can be used to collect and analyze the influencing factors such as temperature and humidity in key monitoring areas. According to the analysis feedback, carry out intelligent prediction, analysis and management of possible geological disasters in this area. On this basis, by means of preset setting and automatic comparison and equivalence, it is compared and analyzed with regional historical data. According to the analysis and feedback results, the abnormal data shall be warned in advance, and scientific and reasonable ways and means shall be taken to strengthen the response.

### **3.3 Intensive and Economical Use of Land**

The land and spatial planning department can actively build a good information co construction, sharing and sharing relationship with the tax department, focusing on the integrated application of a series of spatial information such as land acquisition and development and land tax source registration information. After a series of comparisons, build a land tax source management database to more intuitively show the key information such as the link of each land and the land area. In this way, it can provide good decision support for China's land spatial planning and management, especially in the evaluation of land intensive conservation [6].

### **3.4 Application Analysis of Targeted Poverty Alleviation**

In the application field of targeted poverty alleviation, the current poverty alleviation information can be accurately superimposed based on land data and land resources cloud. By deploying the provincial natural resources poverty alleviation battle map, the current provincial targeted poverty alleviation battle system is scientifically constructed, optimized and improved, so as to further ensure the implementation effect of targeted poverty alleviation.

### **3.5 Ensure the Accuracy and Rationality of Smart City Planning**

In the planning and construction of smart city, relying on big data technology, we can accurately analyze a large number of complex urban planning data. And take the initiative to measure various influencing factors from many aspects to ensure the feasibility and rationality of the urban planning scheme. For example, planners can use satellite remote sensing data to focus on the research and analysis of urban land suitability evaluation, and can also use vehicle GPS data to predict and analyze urban traffic volume. Overall, with the decision support of big data technology, the development level of smart city planning will be further improved.

## **4 Application and Development of Big Data in the Field of Land Spatial Planning and Analysis of Relevant Suggestions**

### **4.1 Emphasize the Core Concepts of Co Construction, Sharing and Sharing, and Build a One Map Big Data System for Land and Space Planning**

Combined with the reform and development in recent years, although the policy concept of “multi compliance and integration” has become an important concept of China’s land and space planning reform, there are still many practical problems to be solved as a whole. For example, the low informationization and poor construction quality of urban and township development spatial resource information platform make it difficult for urban and rural spatial planning to break through the bottleneck of uncoordinated governance, which is easy to affect the sustainability of regional spatial development. In view of this, in order to promote the sustainable development of land spatial planning coordination, provinces, cities and regions should build a standardized and scientific big data management platform in combination with the policy requirements of “multi compliance and one” and the needs of land spatial planning in the new era [2].

Among them, the management platform can actively collect, integrate and analyze various planning spatial coordinate systems and relevant data within the city, so as to effectively enhance the effect of spatial information sharing. In addition, in order to ensure the effect of business collaborative management, the government can conduct collaborative management on the land and space planning and management business involved in the local government departments within the province by adopting the way of government network access, so as to enhance the modern governance ability of the government. During coordination and management, managers should share and apply relevant parameter data and important materials. In addition, we can also rely on emerging technology content such as 5g and Internet technology to strengthen data exchange and sharing. It should be noted that in the process of building a map big data system for land and space planning, managers should make scientific deployment for the information sharing management of various business platforms in accordance with unified construction standards.

#### 4.2 Pay Attention to the Training of Relevant Professionals and Enhance the Efficiency of Big Data Application Management

In the field of land and space planning in the new era, we should strengthen the training of professional planning talents. In addition to mastering the theory and policy content of land and space planning, planning talents should also be good at using emerging technical means such as big data to further enhance the level of land and space planning management. In view of this, it is suggested that relevant units should regularly strengthen the training and education of professional planning talents, so that on-the-job personnel can be deeply aware of the importance of the application of big data technology. And further enhance the efficiency of big data application management by continuously deepening personal technical concepts and professional knowledge architecture [1].

### 5 Conclusion

In short, land spatial planning based on the concept of “multi compliance and integration” pays more attention to the integration and utilization of regional spatial data resources. In view of this, it is suggested that in the future land spatial planning, all provinces, cities and regions should integrate and apply all kinds of resource data involved in the land spatial planning according to the overall requirements of “one map” in the new period. At the same time, in the process of coordinated planning, we should adhere to the principles and concepts of co construction, sharing and sharing, and build a map big data system for land and space planning. It should be noted that in order to ensure the complete construction of the big data platform for land and space planning, relevant government departments and competent units should pay attention to the application advantages of big data technology in land and space development and other special work. It is better to combine the advantages of big data technology, data integration and mining to build a good land spatial planning decision-making system and further enhance the efficiency of comprehensive governance of the government.

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