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**PLANNING AS A TOOL OF EFFECTIVE LAND RESOURCES
MANAGEMENT IN CHINA****ПЛАНУВАННЯ ЯК ІНСТРУМЕНТ ЕФЕКТИВНОГО УПРАВЛІННЯ
ЗЕМЕЛЬНИМИ РЕСУРСАМИ В КИТАЇ**

The article examines the main processes of land use planning in China, since the lack of land resources is an inevitable reality, because the accelerated process of industrialization and urbanization inevitably leads to an increase in demand for land resources (especially in cities). It should be noted that China is currently in a transitional period of rapid socio-economic development and diversification of land use, so the growth of non-agricultural land requires the development of scientific and reasonable land use planning suitable for the national conditions of the state. Three stages of land use planning in China are considered, achievements in this area are summarized, and existing problems are analyzed. We have proposed a concept for the development of «innovation, coordination, sustainability, openness and sharing» which must be taken into account when planning land use. Recommendations for improving land planning in China should include: adapting to the demands of the modern economy, improving planning standards, strengthening monitoring, training personnel, and introducing innovations.

Key words: land, land resources, land use planning, land potential, planning trends, 3S technologies.

У статті досліджено основні процеси планування землекористування в Китаї, оскільки нестача земельних ресурсів – це неминуча реальність, тому що прискорений процес індустріалізації та урбанізації неминуче веде до збільшення попиту на земельні ресурси (особливо у містах). Зазначено, що основна роль планування землекористування – забезпечити основу управління земельними ресурсами. Наголошено, що ефективне впровадження методів планування та управління землекористуванням поки що неможливе без відповідної технічної підтримки. Для покращення управління земельними ресурсами потрібно здійснювати: класифікацію та оцінку сільськогосподарських земель, оцінку придатності землі під будівництво, оцінку інтенсивного землекористування та оцінку впливу на довкілля. Було виявлено, що Китай перебуває у перехідному періоді швидкого соціально-економічного розвитку та диверсифікації землекористування, тому зростання земель несільськогосподарського призначення вимагає розробки наукового і розумного планування землекористування придатного для національних умов держави. Планування землекористування в Китаї було введено в 1950-х роках і відтоді дуже змінилося. В статті розглядаються три етапи планування землекористування у Китаї, основні їх особливості, узагальнюються досягнення, аналізуються існуючі проблеми. На першому етапі вирішення проблем землекористування здійснювалось на мікрорівні. На останньому – планування проводиться з використанням технологій 3S. Це загальна назва технологій дистанційного зондування, географічної інформаційної системи та глобальної системи позиціонування, яка є комплексною технологією, що дозволяє досліджувати ресурси, проводити екологічні випробування та дослідження енергії на землі та під землею в комплексному, тривимірному, швидкому та точному форматі. Нами запропоновано концепцію розвитку «інновації, координації, екологічності, відкритості та спільного використання», яку необхідно враховувати при плануванні землекористування. Рекомендації щодо покращення планування землеустрою в Китаї мають стосуватися: адаптації до вимог сучасної економіки, покращення стандартів планування, посилення моніторингу, навчання персоналу, а також запровадження інновацій.

Ключові слова: земля, земельні ресурси, планування землекористування, земельний потенціал, тенденції планування, технологія 3S.

В статье исследованы основные процессы планирования землепользования в Китае, так как нехватка земельных ресурсов – это неизбежная реальность, потому что ускоренный процесс индустриализации и урбанизации неизбежно ведет к увеличению спроса на земельные ресурсы (особенно в городах). Отмечено, что в настоящее время Китай находится в переходном периоде быстрого социально-экономического развития и диверсификации землепользования, поэтому рост несельскохозяйственных земель требует разработки научного и разумного планирования землепользования подходящего для национальных условий государства. Рассматриваются три этапа планирования землепользования в Китае, обобщаются достижения в этой области, анализируются существующие проблемы. Нами предложена концепция развития «инновации, координации, экологичности, открытости и совместного использования» которую необходимо учитывать при планировании землепользования. Рекомендации по улучшению планирования землеустройства в Китае должны касаться: адаптации к требованиям современной экономики, улучшения стандартов планирования, усиления мониторинга, обучения персонала, а также внедрения инноваций.

Ключевые слова: земля, земельные ресурсы, планирование землепользования, земельный потенциал, тенденции планирования, технологии 3S.

Problem statement. Kent, in 1964, defined a land-use plan as «an official document of legal significance that sets forth the principal policies for the expected future development of the physical environment» [1]. Real land use planning in China began in 1986 with the establishment of the State Administration of Land and the first promulgation of the Land Management Law. So far, it has gone through the course of 35 years. The land use plans formulated successively have played an important role in protecting China's arable land resources, ensuring economic development and ecological environment.

Although China's land use planning started late, the theory and method are not mature, but with the practice and research of land use planning, China's land use planning has made great progress. It is of great scientific and practical significance for promoting the scientific development of land use planning and revising the new round of land use planning to evaluate the progress and deficiency of land use planning in China and to point out the development direction of land use planning in the future. Therefore, the opposite topic is relevant and requires attention from both the state and scientists-economists.

Purpose of the study is the research on land use planning in China is at the initial stage, mainly focusing on the connotation of land use in China, and there are few specialized and systematic comprehensive studies. Although some scientists at home and abroad have studied the supply and demand of land and the correlation between land and economic growth from the perspective of economics, these studies are mainly on the quantity of land resources [2]. The shortage of land resources in China is an inescapable reality, and the accelerated industrialization and urbanization process will inevitably increase the demand for urban land. At the same time, the

importance of food security requires that we have to strengthen the protection of the amount of arable land. The intensive use of land in China is a requirement of China's economic development. From the perspective of economics, we analyze how China's land can be intensively utilized, how much output can be increased by increasing the input per unit of land, and how much it contributes to economic growth; whether sustainable urban economic growth can be achieved simply by increasing the input per unit of land; what are the factors influencing the supply and demand of land in China, and whether these factors influencing the supply and demand of land change the quantity or quality of land in China. Through these analyses, it is of great significance to find a suitable way of intensive land use in China by drawing on foreign economic theories of land use, and to try to quantitatively analyze the contribution of intensive land use to China's economic growth, so as to provide theoretical guidance for alleviating the contradiction of more people and less land in China.

Overview of recent research and studies. Our land use problems have been accompanied by a number of problems since 20th century 1980s. Since the 1980s, the issue of urban land use system, the rapid development of the real estate industry and the rapid expansion of urban land use, and has gradually become the focus of The focus of attention and research in geography, urban planning, economics, sociology and other disciplines. In the context of urbanization, there are few studies on urban land use efficiency and how to measure and evaluate it. According to the information provided by the Chinese Academy of Sciences, the current reasonable population carrying capacity of China's land resources is only 950 million people, which has been far exceeded. According to China Urban Development Report 2015 Edition the average

annual increase in urban population 14 million the increase of urban population means the increase of land area for urban construction, and some arable land will be occupied [3]. The increase of urban population means the increase of land area for urban construction, and some arable land will be occupied. In fact, the total population of China is increasing every year. In fact, the total population of China is increasing every year, and the contradiction between the increase of population and the decrease of arable land will be more prominent. According to international organizations, the arable land per capita 0.053 hectares of arable land per capita is the warning line, and China's arable land per capita is increasingly slipping towards this danger point. Both in terms of urban economic development The intensive use of urban land resources is the way to go, both in terms of urban economic development and the dependence on land for population growth.

China's urban construction occupies a large amount of arable land, and there is a widespread phenomenon of sloppy and inefficient use of urban land stock. Many scholars have proposed the necessity of intensive urban land use. Xu Shuhui proposes that intensive utilization of urban land is a rational choice to solve the contradiction between human and land, an important way to promote rapid development of urbanization and comprehensive improvement of urban quality, and is conducive to strengthening urban land management. Similar scholars with this formulation include Qu Futian and Zhou Yongkang. Liu Weidong, Li Yuan, Cao Jianhai and others also propose that the intensive use of urban land to promote industrial restructuring and transformation of the crude growth mode is an objective need for the healthy development of China's economy and a sustainable development of China's urban society and economy. It is also an inevitable requirement for sustainable urban socio-economic development in China.

On the basis of the necessity of urban land intensive utilization, many scientists have made the study of how to coordinate the shortage of land resources with economic development and promote the ways and measures of intensive land use as one of the important contents of the current research on intensive land use in China [4]. The research on how to coordinate the relationship between the shortage of land resources and economic development and the ways and measures to promote the intensive use of land is one of the important contents of the current research on intensive land use in China. Drawing on foreign experience and combining with the actual situation in China, many regional practices

in China Many examples of intensive land use have emerged in many regions in China. Some scientists have summarized the ways of intensive land use into four aspects [5]. Based on the law of urbanization development, based on market regulation mechanism are based on government macro-control mechanism and based on public participation mechanism.

Some scholars have summarized the ways of land intensive use into four aspects: based on the law of urbanization development, based on market regulation mechanism, based on government macro-control mechanism and based on public participation mechanism. In fact, these approaches are mainly from a macro perspective. Some scholars also suggest that administrative, legal and economic measures can be adopted. Some scholars have suggested that administrative, legal and economic instruments can be used.

Presentation of the main material of the study. Land-use planning in China was introduced from the former Soviet Union in the 1950s and has changed dramatically since then. Using the base years of the three rounds of land use planning as a reference basis, this paper analyses the research results of land use planning in China into three stages and explores the hot spots and key areas in the field of land use planning research in these three stages.

1. The first exploratory phase of land use planning studies 1950s to 1986 years.

As early as the 1950s, land use planning focusing on the construction of the Northeast, Xinjiang, Hainan and other reclamation areas was carried out. By the 1960s, land use planning focusing on farming system, land reclamation and fertilization, irrigation and watershed development and management was prepared. This period basically referred to the land use planning design theory and method of the Soviet Union, mainly focused on the preparation of land use planning for agriculture, solving land use problems in local areas and at the micro level, and was the exploration stage of land use planning in China.

2. The second phase (1997 – 2006 years) of land use planning development.

The second round of land use planning (1997 – 2006 years) was prepared against the background of the promulgation of the new Land Management Law and the establishment of the socialist market economy system, and was characterized by the protection of arable land, with the objective of achieving a dynamic balance of the total amount of arable land.

Compared with the previous stage, the relevant areas of land use planning research have expanded significantly. At this stage, scholars

have not only studied land use planning from the economic, social, policy and management perspectives, but have also begun to focus on research on theories related to land use planning, and have achieved fruitful results. From 1997 to 2006 years, the preparation of the first round of land use planning was completed one after another, and the preparation of the second round of land use planning began on a pilot basis. The research results of land use planning at this stage were abundant, and it can be seen from the keywords co-occurring knowledge of land use planning-related research from 1997 to 2006 that the relevant research mainly focused on environmental impact assessment, land use planning index system, sustainable development, land use planning information system, dynamic balance of arable land protection, sustainable land use, urban planning, FAO, urban planning, market economy and so on. In addition, the brainstorming method was introduced into the research related to land use planning, and the technical research related to land use planning took off. At this stage, in addition to research on indicator systems, research was also carried out on the spatial system of land use planning. Land use control was also a hot topic of interest for some scholars. Scholars also noted the important role of the public in land use planning and stressed the importance of public participation.

This round of planning initially determined the basic procedures of land use planning, explored the contents and methods of land use planning in China, and established a five-level land use planning system. Due to the lagging legislation, it has not been effectively implemented. But as far as the scientific method is concerned, it laid the foundation of land use planning in China. Strengthen ecological construction, accelerate the pace of urbanization, the implementation of regional development strategies and some other major initiatives, planning indicators are mostly broken, posing a challenge to the planning methods under the market economy system.

3. Phase 3 (2007 – 2017 years) Maturity of Land Use Planning.

Before the promulgation of the new Land Management Law, which was prepared in the context of establishing a socialist market economy system, the features the protection of arable land as the main focus, with the goal of achieving a dynamic balance of the total amount of arable land? The revision of phase 3 round of land use planning (2007 – 2017 years) was carried out against the background of the State Council's decision on deepening reform and strict land management.

This phase of land use planning research builds on the previous phase and matured. The relevant areas of research became more widely drawn and comprehensive. At this stage, scholars have not only researched land use planning from many perspectives, but have also achieved many results. Now that the revision of the third round of land use planning has been completed one after another, it can be seen from the knowledge of key words co-occurring in research related to land use planning from 2007 to 2017 years that the relevant research mainly focuses on environmental impact assessment, land use system, land conservation and conservation, land resources, integration of multiple regulations, ecological red line, red line for basic farmland protection, construction land, land evaluation, new urbanization and other aspects. The level of research has slowly shifted from the previous county and city level to village and township level land use planning, emphasizing the importance of the red line for basic farmland protection and the red line for ecological protection. 3S techniques have become an indispensable part of land use planning research, and the evaluation of land use related aspects is also taking on an increasingly important place in land use planning. Public participation has become an indispensable part of the land use planning process. 3S technology is the collective name of remote sensing technology, geographic information system and global positioning system, which is a comprehensive technology that can survey resources, environmental testing and energy investigation on the ground and underground in a comprehensive, three-dimensional, fast and accurate way, and can carry out spatial analysis and dynamic processing and digital mapping through corresponding data changes and graphic images, which is a more advanced and operational space exploration technology.

Based on the analysis of traditional literature, it is known that land use survey and land dynamic monitoring are the basis for good land use planning.

It is clear from the analysis of traditional literature that land use surveys and dynamic land monitoring are the basis for good land use planning, and that the integration of multiple regulations is the future trend in land use planning. Improve the scientific nature of planning, create a policy-oriented land use planning preparation mode, and adapt to the needs of national macro-control at the present stage; emphasize the protection and construction of land use ecological environment, and reflect the idea of sustainable development; study the regional land use policy toward spatial control under the principle of

integrated region; explore the standards of land use planning, and enhance the standardization of planning; apply GIS technology to the practice of planning preparation and management, and improve the technical capacity of planning.

Problems in land use planning are defined by us as:

1. Basic theoretical research on land use planning is still weak.

As an application-oriented land use planning work, it should be developed continuously based on the gradual introduction and absorption of theories and methods of related disciplines. For example, the ecological concept, the concept of circular economy, the concept of people-oriented, etc. have been studied and reflected in different aspects and degrees in the preparation and management of land use planning, enriching the content of land planning science and promoting the development of land planning science. In particular, the theoretical research on land use planning that is adapted to China's national conditions is still blank and needs a lot of practical accumulation and more in-depth exploration. For example, the research on the relationship between land use planning and related planning mainly urban planning, main functional area planning, national economic and social development planning in China is still weak.

2. In-depth study of ways to prepare land use plans.

An effective way to prepare land use planning is to put land use planning into scientific planning. The method of decomposition of indicators under the planned economy can no longer meet the current needs. The main ways of land use planning are planning index system, land evaluation, land demand forecast, land use planning program preparation, land use planning implementation evaluation, upward and downward coordination, public participation and so on. Among them, the pathway of land use control zoning needs to be deepened. From the technical aspect, how to use remote sensing technology to assist land use planning analysis and establish effective land use planning database and management will be an important way to effectively connect land use planning.

3. The basic capacity of land use planning still needs to be strengthened.

The effective implementation of land use planning and management methods is not yet possible without the corresponding technical support. Firstly, the basic database of land use planning is not enough to support the capacity. Secondly, the capacity of land evaluation is not enough. Agricultural land classification and valuation, evaluation of suitability of construction

land, evaluation of intensive land use and evaluation of environmental impact of land use planning are all important bases for scientific preparation of land use planning, and the relevant research still needs to be deepened. Thirdly, the implementation and management of the plan need to have the corresponding land use status, changes and certain evaluation indexes and methods as technical bases, and the capacity building of the relevant parties still needs to be strengthened.

4. Strengthening the link between land use planning and land management to be deepened.

The main role of land use planning is to provide a basis for land management. Some policies of land management such as land use planning management and construction land prequalification management should be based on land use planning. In practice, due to various reasons, there are «planned indicators without planning arrangements» or «planning arrangements without planning indicators». The effective control of land use planning indicators is not enough. On the other hand, as the lower-level planning revision does not require the simultaneous revision of the higher-level planning, only the filing system, how to play its corresponding level of coordination and binding role of municipal and above planning is worthy of in-depth study. Land use planning is the basis of land use management, not a direct means of land management. It is very important to clarify the planning requirements, especially the function of high-level planning in land use management.

Land Use Planning Trends:

1. from «blueprint planning» to «process planning»

A «blueprint plan» means that the future direction of land use development is clear and can be expressed in terms of binding indicators and large scale maps. «Process planning» means that the future direction of land use development is uncertain, and the task of planning is to find these trajectories and select the trajectory of land use change that meets people's needs.

2. from «elite planning» to «participatory planning»

Spatial planning internationally shows a move from physical planning to integrate planning. Just as urban planning puts «more attention on the management level of planning and seeks a way out from the management and control mechanisms such as laws, regulations, decision-making guidance and public supervision». Spatial planning in the international arena is also moving from technical elite planning to policy-oriented participatory planning. In other words, with the development of social economy, land use planning is facing more and more conflicts between different

sectors and different stakeholders, planning and policy making are more important, and humanistic thinking has more and more influence on planning, and «elite planning» will move to "participatory planning. The influence of humanistic thinking on planning is increasing, and «elite planning» will move towards «participatory planning».

3. from «structure-oriented» to «space-oriented»

The structure-based land use planning shows that it focuses on the planning and proportion of land use, ignores the overall spatial layout and regional coordination and has more planning color. The market economy has put forward new requirements for the macro-control function of land use planning, and the national situation of wide geographical area with large differences in land use has put forward requirements for regional land use policy. Therefore, the trend from planning to planning and from structure to space becomes inevitable.

4. from «focus on ensuring the demand for land for economic development» to «emphasize land ecology and environmental protection»

In line with the stage of socio-economic development mainly in agriculture, industrialization and urbanization, and sustainable development, the content of land use planning is characterized by strengthening development and improving land utilization; ensuring development and rational utilization; and intensive utilization and protection of resources, respectively. China is in the strategic opportunity period of economic development, and land ecological security is getting more and more attention.

Conclusions. Recommendations for the new round of land use planning:

1. Adapt to the requirements of the market economy system, clear planning functions, improve planning content.

Starting from the requirements of the market economy system, the function of land use planning is expressed in terms of protecting public interests, making up for market deficiencies, coordinating the interests of different land use subjects, etc., serving land management and serving as a tool for national macro-control. The content of the corresponding land use planning is more indicative, coordinating and anticipatory, avoiding more directives or binding to play the fundamental role of the market in the allocation of land resources. The use of economic instruments, not just administrative ones, is particularly emphasized in the implementation of the plan, with emphasis on the operability of measures and the reliability of the planning scheme.

2. Study the methodology of land use planning, improve planning standards and enhance the normality of planning.

Strengthen the research of planning methods with the main content of land evaluation, land demand forecast, and selection of land use planning preparation. On this basis, gradually study the rules of spatial and temporal changes of land use in different regions, establish different types of land use standards in different regions, and coordinate with the land use indicators or standards in relevant industry planning and spatial planning. Improve the preparation of planning at all levels that is compatible with the spatial planning of land use, and improve the quality of land use planning.

3. Strengthen the monitoring and evaluation of land use planning, and enhance the implementation management of planning.

Two important aspects of land use planning are supervision and evaluation. Implementing management of land use planning through implementation, revision of land use planning, monitoring and evaluation of land use planning implementation are important means to enhance the effectiveness of land use planning and improve land use planning. Firstly, a system of regular supervision and evaluation should be established for the implementation of land use planning. Secondly, the system of revising land use planning should be planned, and the standards, procedures and methods of revision should be standardized and managed. Thirdly, make full use of modern technologies such as remote sensing and geographic information systems to establish an information system for land use planning implementation management, and carry out dynamic management of land use planning implementation.

4. Strengthen the management of land use planning qualification and promote the standardization of industry management.

Establish industry qualification management and practitioner qualification management. Our «Management Measures for Selection and Recommendation of Land Planning Agencies» was introduced in 2012, and further progress has been made in the qualification management of land use planning agencies. On this basis, further establishing a qualification management system for land planners, regulating land use planning preparers and establishing a specialized team with a certain level of professionalism, business quality and experience in the field is an important counterpoint to promote the management of the land use planning industry.

5. Strengthening the construction of land use planning disciplines and personnel training, and innovation of land use planning in China.

Land use planning is a highly applied task, and the political and economic characteristics of each country determine the corresponding

land planning characteristics differently. The root of innovative land use planning in China lies in promoting the discipline from strengthening land use planning theories, methods, and technical

research, as well as cultivating planning talents consisting of multidisciplinary talents include natural sciences, social sciences, and technical sciences.

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