Study on the construction strategy of South Taihu Lake New District under the concept of ecological civilization

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Abstract. With the constantly advancing of urbanization in our country, new urban districts are constantly emerging. High intensity development and construction not only caused a large amount of resource consumption, but also has brought many ecological problems. Therefore, the construction of new urban districts must pay attention to the construction of ecological civilization. Taking the new district of the southern Taihu Lake in Huzhou as an example, this paper combed the contents and the methods of the planning and construction about new urban districts in the concept of ecological civilization. On the basis of the analysis of the current situation, the paper proposes the construction strategy of the southern Taihu Lake from four aspects, such as the high level of design, high standard of control, high-tech innovation and high strength of safeguard, in order to provide some revelations for follow-up construction of the new district.

1. Introduction

With the rapid development of China's economy and urban expansion, new urban districts are constantly emerging. The new urban districts have transferred some of the functions and industries of the old urban areas, alleviating the problems of insufficient resources and traffic congestion caused by the expansion of urban population. The new urban district optimized the urban structure, but it also brought other problems at the same time. Such as uncontrolled urban expansion, resulting in a huge waste of resources. Inadequate management and control in the process of development and construction has led to the destruction of the ecological environment. In the planning and design, these new urban districts were mechanically applied, resulting in the convergence of urban landscape and thousands of cities with same face. These problems have seriously affected the sustainable development of the city [1]. How to rationally develop land and resources to realize the harmonious coexistence of man and nature through scientific planning and control, and to build a new city of ecological civilization with sustainable development?

Based on the investigation of the new district of South Taihu Lake in Huzhou, this paper analyzes the advantages and disadvantages of the new district in terms of regional transportation, ecological environment, industrial development and regional characteristics. It explores the implementation method of territorial space planning, which is guided by the concept of ecological civilization and integrates the overall planning of space, resource renovation and supervision mechanism. In order to build the South Taihu Lake New District as the “two mountains” practicing demonstration area with a view to high-level and high-quality, to guide the future development of Huzhou, while providing reference for the construction of other ecological new districts.
2. Background Survey: Status of the South Taihu Lake New District

Located on the South Bank of Taihu Lake and on the north side of Huzhou City, the South Taihu New district is one of the four new districts in the Great Bay district of Zhejiang Province. The regional scope includes the Huzhou Economic and Technological Development Zone, the Industrial Agglomeration Core Area of South Taihu Lake, Taihu Tourist Vocation Zone and some areas of Changxing County. This paper investigates the current situation of South Taihu Lake New district and analyzes its development advantages and existing problems.

2.1. Development Advantages of South Taihu Lake New District

2.1.1. Excellent location, convenient transportation. Located on the South Bank of Taihu Lake and in the center of Yangtze River Delta, the South Taihu Lake New District is an important part of the metropolitan area of Shanghai and Hangzhou. It plays a vital role in connecting the east with the west in the urban agglomeration around Taihu Lake, and its geographical position is superior. The traffic in the region is well-developed, and Shanghai-Jiaxing-Huzhou Expressway and Hangzhou-Ningbo High-speed Railway pass by, which are important nodes connecting the eastern and central regions of Yangtze River Delta.

2.1.2. Good ecological foundation. South Taihu Lake New district is located in the upper reaches of Taihu Lake. The area comprises an endless number of lakes, wetlands and Lou Harbor water systems which form a rich wetland ecosystem. It improves the quality of water which enters Taihu Lake and maintain the ecological security of the region. Lou Harbor system in the south shore of Taihu Lake forms a broad interlaced buffer zone between land and water, which breeds abundant animal and plant resources, and provides support for regional ecological development. As shown in the figure 1.

![Figure 1. The present situation of Daqian lake in South Taihu Lake.](image)

2.1.3. Deep cultural heritage. Along the south coast of Taihu Lake lies the world cultural heritage of irrigation engineering - Lou Harbor of Taihu Lake, which contains a series of cultural relics and historic sites such as Lou Harbor, polder land, ancient bridge, archway. The famous system of mulberry fishponds shows the ecological wisdom of local residents and reflects the adaptive transformation of specific ecological environment under the interaction between man and nature. With the reproduction and development of Lou Harbor, a large number of ancient villages and towns have developed, which has given birth to a rich and splendid culture of agriculture and fishery in Taihu Lake.

2.2. Existing problems of South Taihu Lake New District

2.2.1. The region develops slowly. South Taihu Lake New district has not fully rely on the resources of the lake to form a development strategy that is complementary with the advantages of surrounding lakeside cities and dislocation competition. Its positioning is not clear, the advantageous industries are also not obvious and it lacks attraction to the external population. All this has led to slow regional development. Although the region has the Moon Hotel, Silk Town and other advantageous project, but they have not driven the overall development of the region. Compared with the surrounding cities around Taihu Lake, there is still a gap between scale and development speed [2].
2.2.2. Destruction of local ecological environment. The rapid development of land transportation has reduced people's attention to the river. Part of the water system in the area is in the plug, causing serious pollution of the local wetland system, which in turn threatens the entire ecological environment. The phenomenon of digging mountains and rocking in the lakeside area is common, which led to the mountain damaged. Some buildings are built by the lake, which destroys the landscape pattern of the area [3]. With the acceleration of urbanization, uncontrolled construction has brought threats to the ecological environment of Taihu Lake.

2.2.3. Low utilization of resources. The utilization and protection rate of existing resources in the region is not high. Lou Harbor polder system has not been effectively protected and utilized, and it has gradually declined and its identification became weak. Some ancient villages, towns, historical sites and cultural relics related to Lou Harbor which have been partially destroyed, the situation of protection and inheritance of historical context is serious. Some lakeside embankments were destroyed due to excessive construction, which affected the layout of public facilities and the development of tourism and cultural industries in the later period.

In summary, the South Taihu Lake New district has a superior geographical location, a good ecological foundation and profound cultural heritage. The regional Lou Harbor polder system has a high cultural value and a great potential for regional development, but there are also many shortcomings, such as the deterioration of local ecological environment, regional positioning and industrial development is not clear. It is necessary to seek suitable strategies for further overall planning.

3. Methods To Explore: The construction of new cities from the perspective of ecological civilization

Since the 18th National Congress of the Communist Party of China (cpc), the thought of economic and social development has influenced the inner category and value orientation of urban development. Adhering to the ecological civilization concept of harmonious coexistence between man and nature has become the inner core of urban development in the new era [4]. Land spatial planning integrates urban and rural planning, major functional area planning, land to use planning and many other contents. By means of hierarchical and classified planning, it is a strong handgrip for ecological civilization construction to renovate land and space resources, protect and restore ecological environment. This paper combs the contents of the land spatial planning of the new urban district from the aspects of current situation assessment, planning compilation, overall management and control, supervision and implementation, etc. to guide the construction and development of the new district of South Taihu Lake. As show in Fig. 2.
Figure 2. Construction strategy of South Taihu Lake New District under the concept of ecological civilization.

3.1. Status assessment, clear location

This paper analyzes the ecological environment, economic and social development of the new urban district, and evaluates the suitability of the development of land space. Ecological environment analysis refers to a comprehensive analysis of the ecological carrying capacity, suitability and sensitivity of environmental resources (water resources, cultivated land resources, forests, wetland systems, etc.) in the region, to ensure that the development scale and intensity of the new urban district will not exceed the minimum carrying capacity of environmental resource [5]. Economic and social development analysis refers to the analysis of economic development, industrial structure, population situation, regional culture, etc. Based on the evaluation and analysis, relying on the big data support of the information system platform to determine the Industrial development direction and the target of the new district. The intensity of development and the capacity of population development are determined by the way of determining land by people and land by production [6].

3.2. Scientific planning, ecological priority

On the basis of suitability evaluation of territorial space development, the control index of ecological development is studied, the “three zones and three lines” are demarcated, and the general plan of territorial space development, utilization and protection is worked out. In the layout of land use, it emphasizes to mix and diversify the structural layout, coordinate green corridors and ecological networks, and form an integrated pattern of ecological elements. In the construction sequence, it proposes implementation plans for major projects such as land rehabilitation, ecological restoration, and overall allocation of infrastructure and public service facilities. In terms of industrial development, it concentrates on the development of industries with ecological characteristics, enhances the ability of regional radiation to drive development, and create a high-quality urban space that is suitable for industry and habitation [7].

3.3. Co-ordinate control, multi-rule integration

The planning of the new urban district should adhere to the principle of bottom-line thinking and ecological priority, and construct a planning and management system that coordinates the whole area planning, use control and layer-by-layer convergence. On the basis of the “three zones and three lines”
to implement the overall management and control of “three types of space, six major division”, we have to adhere to the principle of ecological priority and green development, formulate space management and control measures that are rational, hierarchical and appropriate in law. Adopt a multi-control mode combining structural management and control, intensity control and use management, emphasize global coverage and take multiple measures simultaneously, and control various land space development behaviors at different levels to promote the rational use of land space.

3.4. Planning assessment, implementation of supervision.
By using the methods of hierarchical analysis and comprehensive evaluation, the scientificity and feasibility of the spatial planning about urban new districts is analyzed, the implementation guarantee mechanism is formulated to ensure that the construction of new urban areas is consistent with the ecological development goals [8]. Establishing an information-based management platform for space planning, strengthening the control over the use of territorial space, and establishing a hierarchical supervision and review mechanism that can be dynamically tracked and maintained sustainably. Improving the communication and feedback mechanism between departments at all levels, playing the role of feedback and early warning, and forming interaction with the implementation of the plan to ensure the effective implementation of the plan [9]. In order to encourage the development of the green new district, we should set up the multi-integration investment mechanism and the ecological compensation incentive mechanism and introduce policies from the aspects of the target of the incentive and subsidy, the way of the incentive and subsidy and the scope of the subsidy.

4. Strategic Planning: Exploring the ecological development of South Taihu Lake New District
South Taihu Lake New District shoulders the heavy responsibility of leading the transformation and upgrading of Huzhou. In the initial planning, the concept of ecological civilization should be closely integrated with the national spatial planning. A scientific and reasonable national spatial planning and control system should be constructed, and an effective safeguard mechanism should be established to promote the sustainable development of the new district.

4.1. High-level design and development plan for new districts
4.1.1. Spatial layout design to build a scientific and reasonable layout form. The spatial layout design should have a high starting point, high standards, high quality, and an international perspective. Anchoring the ecological foundation of the South Taihu Lake New district, land resources should be developed rationally with a low-density development. The spatial layout adopts “one core, one zone, multiple points” as the group layout program. That is the core functional areas with major leisure tourism projects and integrated service facilities projects, the development zone of characteristic industrial with ecological conservation function and the development nodes with different functions and characteristics such as Taihu New Town, Huanlou, Daqian, Yangxi and so on.

4.1.2. Urban landscape design to shape a new era with regional characteristics. The dense network of water, the water flowing beneath a little bridge in the region reflect the characteristics of Jiangnan Water Township culture. The village and town pattern of pillow water habitat is the beautiful memory of Taihu Lake Water Township, which is also the epitome of “beautiful China”. The construction of the green new district should continue the traditional style of Jiangnan and the characteristics of the Lou Horbor’s culture, coordinating the landscape style, and reflects the regional characteristics and the style of the times.

4.1.3. Integrated traffic design to build an efficient green transportation system. We will speed up the establishment of fast transportation between the South Taihu Lake New District and the surrounding cities, and promote the seamless integration of the new district with other cities in the Yangtze River Delta. According to the network layout and integrated service requirements, we will build an efficient green transportation system. We will adhere to the priority of public transport and layout comprehensively various types of urban transportation facilities to achieve a variety of traffic modes of smooth transfer, the formation of a multi-level, full coverage, humanization of the basic public service network [10]. Creating a “blue road + greenway” composite ecological leisure transportation system to achieve the size of the water system intersection of the “blue road”. The
ecological natural landscape connects historical and cultural villages and tourist resorts in series to form the “greenway”, to provide a new way of sightseeing and leisure for citizens and tourists.

4.2. High standards of control to build a regional integrated control system

4.2.1. Planning and controlling to guide regional integration. The concept of “whole-domain planning, domain-wide control” should be implemented to establish the seriousness and authority of planning control and to promote integrated planning and control as guidelines for the construction and management of each area and each subject. Strengthen the link between the central urban area and the South Taihu Lake New District in the planning of land uses, integrated transportation system, municipal measures, etc. The new regional urban design coverage, the formulation of new district control guidelines and unified control of landscape features should be implemented. The “urban design + control regulation” of the two-control model is adopted to ensure the coordination of adjacent units and blocks between the unified.

4.2.2. Ecological control to build an integrated control system of ecological elements. Statistics on the natural ecological resources of the site, as the basis of regional development, protect the lakeside ecological network based on the water system of Lou Horbor in Taihu Lake. The urban development buffer zone between the new district and Taihu Lake is preserved. Protecting and controlling the characteristic resources such as mountains, otters and villages in the area around the lake to construct an integrated control system of ecological elements. In strict accordance with the red line of ecological protection of land and space planning, the key protection of basic farmland and important waters in the new district will be carried out to form a comprehensive ecological security pattern.

4.3. High-tech innovation to guide the development of innovative green industries

4.3.1. Energy innovation to reduce energy consumption of green new district. In the construction of ecological new district, with the premise of promoting energy-saving green buildings in an all-round way. The green new district will be constructed with ecological, high-end and international standard. We will encourage the development of new energy technologies such as solar energy and bioenergy and adopt efficient energy use models to increase energy use, and reduce the energy consumption of buildings and residents.

4.3.2. Industrial innovation to enhance the competitiveness of green new districts. Adhering to the principle of the integration of productive cities and the production of the city and relying on the advantages of ecological base and historical and cultural heritage, to build three industrial service chains of natural ecology, human ecology and urban ecology. The guidance of each regions and industries will be strengthened through policies such as land and finance and so on. Core area to leisure tourism, lakeside resort industry-based, focused on the cultivation of boutique hotels, health care, leisure business and other tourism status, to create “South Taihu Lake ecological leisure resort”. Taihu Lake New Town area develops scientific and technological research and development, digital network, trade and logistics and other urban industry integrated services, to create “industrial integrated services ecological new city”.

4.4. High-intensity guarantees to ensure efficient and orderly implementation of new district construction

4.4.1. Mechanism guarantees to establish a sound planning implementation guarantee system. In order to promote the construction of green new districts effectively, government departments should improve administrative measures, increase supervision of planning implementation to establish a series of certification evaluation system to ensure the implementation of planning. At the same time, the research on planning technology, planning standards should be strengthened to build a technical support system. The ecological incentive policy, from the incentive subsidy fund object, incentive subsidy mode, incentive scope and other aspects should be established to encourage the ecological development of the new district. The policy guidance is used to promote the ecological construction of the new district from passive to active, from compulsory to self-conscious.

4.4.2. Mass protection to guide the masses to actively participate in the construction of green new districts. In order to encourage the development of the green new district of South Taihu Lake, the
government should establish a diversified compensation mechanism suitable for regional development, and give some compensation for the enterprises and the masses that are closed down to protect the ecosystem. We will strengthen the popular education of the people's knowledge of the ecological environment and vigorously advocate the concept of green low-carbon, environmentally friendly and economical way life and consumption. Guiding the public to protect the ecological environment consciously and actively participate in the construction of green new districts.

5. Summary
The South Taihu Lake New District will be guided by the concept of ecological civilization, and work out the management and control system of the national spatial planning on the basis of “multiple plans merge into one”, so as to carry out planning preparation, planning approval, planning implementation, evaluation and adjustment, supervision and guarantee work on the “one map”. The new district takes the lakeside area of South Taihu Lake as the main body, with the ecological development as the main line, and it strives to create the image of South Taihu Lake as a “Lakeside New district, Industrial Highlands and Ecological Model” and strives to become a national demonstration area for practicing the concept of “two mountains”. While exploring the development model of the new urban district under the guidance of ecological civilization, the experience and theory are summarized to form the development mode of the ecological new district that can be replicated and promoted.

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