

# Study on the Theory and Method of Landscape Planning and Design of National Parks

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**Abstract:** At present, the research on national parks in China has just started. Domestic studies are mostly carried out from the concepts, functions, comparison of natural reserves between China and foreign countries, legislation and management, and Research on pilot areas. The theories and methods of landscape planning and design are still in the embryonic stage. On the basis of studying the development background of national parks at home and abroad, this paper analyses the problems existing in the landscape planning and design of national parks in China, explores the theory and method of the landscape planning and design of national parks in China, hoping to provide some reference value for the future landscape planning and design of national parks in China.

## 1. Introduction

National parks originated in the United States in modern times. Yellowstone Park, the first National Park in the world, was built in 1872. National parks, as an important model of natural reserves, have been paid attention to and applied by more and more countries. According to WDPA World Protected Areas Database, as of August 2019, national parks have developed to 225 countries and regions around the world. Since the Third Plenary Session of the Eighteenth Central Committee put forward the establishment of national park system in 2013, China has developed rapidly in the past six years. Ten pilot areas of national parks have been established, such as Sanjiangyuan, Qilian Mountain and Qianjiang River[1]. On August 19, 2019, the first National Park Forum opened in Xining, Qinghai Province. General Secretary Xi Jinping wrote congratulations and emphasized that the purpose of implementing the National Park System in China is to maintain the authenticity and integrity of natural ecosystems, protect biodiversity, protect ecological security barriers and leave precious natural heritage to future generations. National parks are the inevitable product of economic and social development at a certain stage. Before solving the problem of food and clothing in the last century, strict protection and prevention of deforestation and occupation and destruction are the main contradictions facing protection. Today, people's awareness of ecological protection is generally improving, and people's awareness of protection and recreation is increasing. The need for ecological education is also growing, and the development of national parks is promising. Compared with other countries such as Europe and America, China put forward the establishment of national parks later. The related research has just started. The construction of national parks in the world has a long history and rich practical experience. The mode of landscape planning and design is relatively mature. We should learn from the mature experience in the world to design national parks in China. It's a good reference[2]. As an important mode of natural protection, national parks have been paid more and more attention and applied by more and more countries. The construction of national parks is of great strategic significance for promoting the construction of ecological civilization and realizing "Beautiful China".

## 2. Entering National Park

The rudiment of the National Park is Yellowstone National Park in the United States. At the beginning of its establishment, it was clearly stated in the form of a decree that the national park service system was established to protect wildlife in natural scenery and historical sites, and to

provide entertainment places for tourists. Since 1872, the concept of national parks has gradually been accepted by all countries in the world. According to their own characteristics and conditions, countries have gradually established a national park system suitable for their own national conditions and improved the concept and location of national parks. From a single concept of national parks, the concept of “national parks and protected areas system” and “Sheng Sheng” have been derived. Some concepts such as biosphere reserve and World Heritage Site are discussed.<sup>[3]</sup>

At present, there is no clear definition of national parks in our country. Based on the basic national conditions of our country, combined with the experience of national parks in Yunnan province, we can make a summary. National parks are not equal to nature reserves, nor to national parks. National parks are national natural parks, which have the nature of both natural protection and park recreation. They are non-expendable utilization of natural ecosystem resources, in order to preserve and display human resources and natural resources and their landscape of national or international significance. They integrate protection and development into a whole, and also include education, science, recreation and community. Development and other functions to achieve effective protection and rational use of resources in specific areas<sup>[4]</sup>.

### **3. Problems in Landscape Planning and Design of National Parks in China**

The main task of landscape planning and design of national parks is to rationally allocate various infrastructures, coordinate the construction of landscape zones, handle the relationship between resource protection and utilization, and guide the protection, utilization and development of national parks on the basis of comprehensive research and determination of the scale, nature and spatial development layout of national parks. To minimize the threat of man-made activities to nature and pursue the concept of inaction in landscape planning and design. At present, the construction of national parks in our country is at the initial stage. Due to lack of experience, there are some problems in the process of landscape planning and design practice.

#### **3.1. Overemphasize National Park Characteristics**

In the process of landscape planning and design of national parks, many experts will ask for prominent features. In fact, as far as a certain climate area or geographical unit is concerned, tourism resources are congenital and objective, and can not be changed by human resources. Therefore, in landscape planning and design, the overemphasis on highlighting the characteristics of national parks is tantamount to distorting the guiding ideology of national park planning and deviating from the original principle. The core goal of the overall planning of national parks should not be the so-called characteristics, but the scientificity and sustainability of planning under the premise of protection, such as the rationality of functional zoning and overall layout, the consistency of architectural design with local residential culture, history and culture, and the fitness of planning roads with topography and tourism resources. . Only by protecting and displaying the inherent landscape elements such as vegetation, water system and mountain body to the maximum extent, and connecting the primitive features and scenery of historical and cultural elements in an orderly way, can the goal of national park landscape planning and design be pursued.

#### **3.2. Planning scope of national parks converges to administrative boundaries**

The determination of the planning scope of national parks should take into account the natural ecological environment, the main vegetation types, the continuity and integrity of animal habitats, the basic layout of existing villages and the division of community administration. However, the existing regional planning of national parks in China is mostly based on Forest Farm boundaries, County boundaries, rural boundaries, and other natural features such as rivers, ditches and beams, which often divides ecosystems, fragments and islands of animal habitats, and aims of protecting ecological environment, animal and plant resources and forest ecosystems in national parks. The inconsistency also brings hidden dangers to the follow-up management of national parks.

### **3.3. Laws and regulations are not perfect and there is no clear and unified plan**

The imperfect laws and regulations of national parks make it impossible to really establish a national park system, to provide strong protection for planned national parks, to give full play to the functions of national parks, and to mobilize the enthusiasm of the people in building, protecting and managing national parks. Lack of clear and unified planning in national parks leads to the drawbacks of confusion in management, unclear powers and responsibilities, and imbalanced interests of various departments. Because of the limited economic strength of our country at present, we have to decentralize the management authority of national parks. In reality, it seems that everyone can exercise the management power instead of the state. In the end, which department can exercise the management power instead of the state, and which department can give full play to the social and economic value of the protected area as a resource.

## **4. Study on the Theory of National Park Landscape Planning and Design**

At present, there is little research on the theory of national park landscape planning and design at home and abroad. This paper mainly starts with the theory of landscape planning and design.

### **4.1. Theory of Sustainable Development**

Sustainable development emphasizes the ecological rationality in economic development and does not have a negative impact on resources and environment. Its core idea is that healthy economic development should be based on ecological sustainability, social justice and people's active participation in development decision-making. Therefore, in the process of landscape planning and design of national parks, we should always adhere to the red line of ecological protection and establish a long-term mechanism for the management of protected areas, which not only preserves places of recreation, education and scientific research for contemporary people, but also leaves valuable heritage for future generations. The planning and design of national parks should not only solve the problems of the management system of the protected areas themselves, but also explore a way to alleviate the contradiction between man and land, promote the development of surrounding communities and promote public environmental education.

### **4.2. Limits of Acceptable Change**

Limits of Acceptable change can be translated into Acceptable change limits in Chinese. It is a theory used to solve the protection and utilization of landscape resources in national parks. Since the 1990s, it has been widely used in the design and management of national park landscape in the United States, Canada, Australia and other countries, and achieved good results. As long as there is utilization, resources will inevitably be damaged. The key issue of variation is whether the change is Acceptable. The protection of landscape resources and the utilization of landscape recreation are the two major objectives of national park planning and management. To achieve a balance, both objectives must be compromised. At present, Limits of Acceptable has been praised and applied by most scientists<sup>[5]</sup>.

### **4.3. Zoning**

Zoning technology originated in Germany at the end of the 19th century. The application of Zoning technology to the functional zoning of national park landscape originated from the practice of the National Park Administration of the United States. The functional zoning system of national parks in the United States has a developing process. The dichotomy is the earliest division of national parks in the United States. National parks are divided into recreational and natural areas. Next, because of the need to protect the microclimate, geology and ecosystem integrity of the core natural area and to reduce the direct impact of human activities, a three-part method was introduced to set up a buffer zone between the surrounding recreational areas and the core nature reserves. With the continuous expansion of the scope of national parks, the increasing types of facilities, and the changing ways of interpretation and education, the three-thirds partition method has been unable to meet the management requirements of national parks. In 1982, the National Park Administration of

the United States stipulated that national parks should be divided into four regions: natural area, Park Development area, historic area and special use area according to the degree of resource protection and the intensity of exploitation and utilization, and each area should be further divided into several sub-areas. This zoning system is suitable for the characteristics of American national parks, such as diversity, abundant resources and vast land. It is also a relatively complete zoning technology in the world so far. In 1998, the National Park Service made further adjustments to its zoning system<sup>[6]</sup>.

## **5. Study on Landscape Planning and Design Method of National Park**

### **5.1. Master plan**

The overall planning of national park landscape should implement the principles of comprehensive protection of natural environment, active scientific research, attention to popular science education, rational development of recreational activities, vigorous development of community economy, adherence to the principle of priority protection and rational distribution. All construction projects should be conducive to the protection of environment and resources, and should not be allowed to do so. It will cause new environmental pollution, properly handle the relationship between protection and development, and ensure the sustainable use of resources. Classified construction and zoning management, according to the characteristics of resources in national parks to determine the construction and management strategies, targeted arrangements for various types of construction projects, and according to the characteristics of zoning formulate management measures. Emphasis should be laid on and implementation should be carried out step by step. Construction contents, scale and stages should be determined according to the current situation of national parks and the objectives and tasks of protection and management. National parks should be built by stages, and smaller parks can be built at one time. Emphasizing practical results and adapting measures to local conditions, the layout of construction projects should follow natural, social and economic laws, and try to use local materials to save costs and improve effectiveness.

### **5.2. Functional partition**

Based on China's national conditions, the function of landscape planning and design of national parks in China is to “give priority to protection and develop in harmony”. National parks should have five functions: protection, education, scientific research, recreation and community development.

#### **5.2.1. Protection Function**

The establishment and sustainable development of national parks depend on the complete preservation of their unique natural resources. The theme and basic point of National Park work should be the protection of natural resources. Protection means that the object of protection is vulnerable and fragile, which requires the strong human society to give special care and care for its own sustainable development and sustainable use of resources. Biodiversity in national parks is abundant in landscape, ecosystem, species and gene level. Especially, preservation of genetic resources which have not been fully recognized by human beings is very important for the future development of society. Conservation therefore remains the primary function of national parks.

#### **5.2.2. Educational function**

National parks are not only the landmark image of a country or region, but also a natural educational base. The protection measures of national parks can only be implemented through the cooperation of people inside and outside the region. Scientific research, development and utilization can not be separated from the support of the society and relevant departments. Today, the world is beset by ecological destruction and facing many environmental problems, we need ecological civilization more. Forest, ocean, grassland, animals, plants and other natural landscapes and biodiversity are the best textbooks for the education of ecological civilization. To maintain these

natural and human resources with high protection, scientific research and inheritance, and to continue to enjoy the benefits brought to us by the ecological environment, we need to rely on the support of people from all walks of life. To achieve this goal, we need effective strategies to publicize and educate the public. Therefore, as a preliminary attempt to establish national parks in China, national parks should make up for the neglected function of nature reserves and make national parks an important place for the public to recognize nature, ecosystems and species. Therefore, the educational function is the main function of national parks.

### **5.2.3. Scientific Research Function**

National parks contain tremendous potential for human and natural scientific research. In particular, national parks developed on the basis of human, natural and landscape resources can provide favorable conditions for the study of ecology, biology, geology, Paleontology and other disciplines, for the detection and location of the environment, and for the evolution of biological populations and species. It provides a good foundation for development research, and its scientific research value is an important function of national parks.

### **5.2.4. Recreational function**

National parks are unique, and they are rare natural or cultural landscapes. Although the recreational function is also reflected in the management of nature reserves, it is often in a weaker position, and even some managers are inclined to refuse to talk about tourism in nature reserves. Therefore, on the basis of effective resource management, highlighting the recreational function should be a major function of national parks different from nature reserves.

### **5.2.5. Community Development function**

After the completion of the National Park, local residents were not allowed to reuse the resources in the park area, resulting in poverty in some places. Therefore, the pressure on the poor on the basis of park resources is considered to be a serious threat. Gradually, Park reserves have to face the problems of poverty reduction and other livelihoods. Therefore, in order to build a national park, it is necessary to incorporate community development issues into it, formulate effective and reasonable community development projects, and the sustainable development of the community can also guarantee the sustainable development of the national park. Therefore, the function of community development is also the main function of national parks.

## **6. Conclusion**

Landscape planning and design of national parks should preserve and display natural and human landscape resources of national or international significance, which have functions of science, education, recreation and community development. Only by effectively protecting and rationally utilizing resources can national parks become a protected area for sustainable development. The concept of national parks originated in the United States and evolved all over the world. The experience of landscape planning and design of national parks accumulated by western developed countries can be used for reference. However, the landscape planning and design of national parks in China should be based on the national conditions and local conditions, and the national park system should be defined according to the current situation of various protected areas. In order to develop a national park landscape planning and design system with Chinese characteristics, we should take social public welfare as the highest criterion, highlight the advantages of resources, effectively balance the relationship between protection and utilization.

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