

LETTER TO THE EDITOR

The Layout Integration of National Fitness Path and Urban Ecological Environment

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As an important part of service facilities for public sports, the path of national fitness plays increasingly important role in meeting the physical and fitness needs of urban and rural residents and improving the physical quality of the whole people. As the coverage of the nationwide fitness path in the city continues to expand, more and more residents in urban community enjoy the convenience of the national fitness program. However, it is still in the initial stage of development, and the fitness path has problems such as uneven inter-regional allocation, improper use, and poor management. In the case of insufficient overall allocation of public service resources in China, how to make the spatial layout of sports service facilities more scientific and reasonable, and to achieve equal allocation of public resources is of great significance. Based on the background, this paper starts from the perspective of urban and rural planning, and focuses on the relationship between natural ecological elements and the path of national fitness with ecological science as the main line. The spatial layout method for the joint development of material space and natural ecology has been explored, which has great practical significance and application value for urban development and national fitness.

National fitness; path; ecological environment; layout; integration

1 Introduction

At present, there are problems in the construction of the national fitness path, such as narrow path coverage, unreasonable station configuration and layout. These problems constrain the residents' access to the fair enjoyment of public sports service facilities and the realization of equalization goal at the government's public service. In order to solve the above problems, relevant scholars have conducted in-depth research and obtained certain research results (Webb et al. 2017).

Yuejing Gao, Jingyuan Zhao published an article in the *Ekoloji* (Issue 106, 2018), entitled "Environmental Approach to the Path of Urban Ventilation Path Planning in China from the Perspective of Climate Change and Multi-Dimensional Control" (Gao and Zhao 2018). The article points out that with the rapid development of urbanization, ecological problems such as heat island effect and air pollution in urban climate are becoming more and more serious. This has led to the study of urban ventilation corridors gradually entering the field of vision. This paper analyzes the necessity of urban ventilation route planning from the environmental, and summarizes the research progress of urban ventilation route planning in China. Taking the fitness path as a specific example, the fitness path is combined with the urban ecological plan. It is concluded that there are problems of serious homogenizations, too many qualitative research, chaotic index system and insufficient planning linkage in the

fitness path planning (Martire et al. 2018). In response to these problems and ecological challenges, some countermeasures have been proposed to guide urban development.

Based on the above, this study selected Hongshan District of Wuhan as an empirical analysis object. Based on the resource allocation theory of public service facilities such as location theory and location allocation model, according to the principle of efficiency and fairness, the spatial layout characteristics of the path facilities of the national fitness in the communities under the jurisdiction of Hongshan District were studied by geospatial analysis. It aims to explore an analytical evaluation method and optimization plan suitable for the spatial layout of public sports facilities resources in urban communities (Sim 2017). On the basis of literature review, the paper summarizes the configuration and spatial layout of public service facilities, and sorts out the theoretical basis of site selection and layout of sports facilities in urban community. Combine the theory of public resource allocation with analytical techniques to analyze and evaluate the current level of the national fitness path in the Hongshan District community. Its contents include coordination of service population, carrying capacity, population distribution and accessibility of road network. The analysis results are presented in the form of map visualization.

2 Idea description

Taking ecological city as the goal of current urban construction, this laid the basic research ideas and theoretical basis for this study. Then, by summarizing the main functions and basic characteristics of natural ecological elements, the interaction between the national fitness path and natural ecological elements is analyzed. This paper provides a realistic entry point for the spatial layout of the national fitness path that incorporates natural ecological elements. This paper explores the spatial layout method of the national fitness path that integrates natural ecological elements from various aspects, and initially forms a set of planning approach for spatial layout planning method of national fitness path that integrates natural ecological elements. This is the core part of this paper.

2.1 Natural ecological elements

From an ecological point of view, no creature on earth can escape from a specific living environment, also known as habitat. Those environmental elements that play a direct role in the life activities of living things in habitats are called ecological elements, also called ecological factors. Therefore, natural ecological elements refer to elements that have direct or indirect effects on the growth and distribution of living things in the natural environment (Huan et al. 2018). In nature, various ecological elements in biological ecosystems always act in an integrated manner and are subject to natural laws. However, under different conditions, there are always one or more ecological factors that play the leading role. Ecologists have different classification methods for ecological elements with complex conditions. The more traditional classification method is to divide the natural ecological elements into two types: biological elements and non-biological elements. The former includes relationships within species and interspecies relationships; the latter includes climate, soil, and topography.

2.2 The basic principle of the ecological space layout of the national fitness path

The ecological spatial layout of the national fitness path is to introduce the ecological relationship between the human and the natural environment into the internal spatial structure of the national fitness path. The ecological principles are used to analyze and study the state and development trends of the spatial structure of the national fitness pathway. Ecological planning is used to find effective ways to solve problems, which provides ecological support and theoretical basis for the scientific development of the spatial layout of the national fitness path (Mitchell et al. 2018). The main theoretical achievement is the principle of adaptation. The principle of adaptation requires that the pattern of urban spatial layout must be closely integrated with the natural environment. Considering the city's topography, geomorphology, geology, meteorology, hydrology, etc., natural ecological

factors have the impact on urban space development. The population, land use, and industrial scale that promote urban development are in harmony with the natural environment. The relationship between urban land carrying capacity and land development and utilization intensity should be scientific and reasonable in order to improve the ecological efficiency of the land. The environmental impact of the planned urban spatial layout should also be evaluated so that the model of planned urban spatial layout is as conducive to the continuation of the natural spatial structure.

2.3 Unified planning of urban ecology and national fitness path

After the 1970s, in the planning of the spatial layout of the national fitness path, the introduction of ecological planning changed the state of the artificial environment and the natural environment, which is the major breakthrough in the spatial layout planning of the national fitness path. The main work content of the spatial layout planning of the national fitness path is to guide the spatial layout of the national fitness path based on the social development goals and the requirements of environmental protection, with the rational allocation of urban and rural land and space resources as the core. Ecological planning advocates the city as an integral part of nature. Improve the quality of the ecological environment through the layout and arrangement of various ecological relationships in the city, and promote the virtuous cycle of the ecosystem. Ultimately, achieve sustainable development and coordinated symbiosis between man and nature, people and the environment (Coquet et al. 2018). From the perspective of the development trend of modern cities, the integration of urban planning and the spatial layout planning of the national fitness path under a theoretical framework has important theoretical and practical significance for both. Urban ecological planning should follow the nature of the city, development strategy and urban construction policy. The spatial layout of the national fitness path should not be limited to the traditional land use planning model and socio-economic model. It should also respect the core idea of regional ecology, comprehensively consider social, economic and ecological benefits, and adjust the unreasonable ecological relationship in urban ecosystems according to local conditions. Figure 1 is a partial view of the national fitness path that integrates the urban ecological environment.



Figure 1 Partial view of the national fitness path that integrates the urban ecological environment

2.4 Selection of natural ecological factors

The natural ecological factors selected in this paper mainly include four aspects: topography, geology, climate and soil. They are closely related to the human movement, can play an ecological role in the urban ecosystem, and affect the development direction of the spatial layout of the national fitness path. The content of the research is not only the natural ecological factors such as topography and river water system, but also the dynamic relationship between it and the spatial layout of the national fitness path.

2.4.1 Topography

In the natural environment, topography refers to the general name of the shape and landform of the object, specifically refers to the various states of high and low fluctuations (Tang 2018). A variety of natural terrain types such as mountains, hills, basins, plains, etc. determine the spatial characteristics of the city and the specific functional space environment. These form different types of urban styles and give the city certain constraints. Therefore, this paper selects the topographic as the primary factor.

2.4.2 Geology

Geology mainly refers to the nature and characteristics of soil and stone. The good or bad geological conditions directly affect whether the land can be used as the path for national fitness, or whether geological safety needs to be considered in the process of utilization. At the same time, the rich and diverse geological structure mechanism within the urban space can also form the landscape with regional characteristics.

2.4.3 Climate

Climate is an important parameter in the spatial layout planning of the national fitness path. Understanding and studying the distribution of climatic factors (such as rainfall, sunshine, temperature and humidity, wind direction, etc.) in specific regions is necessary for the rational layout of the national fitness path.

2.4.4 Soil

The type, texture and mineral composition of the soil affect the choice of the spatial layout of the national fitness path to a certain extent.

3 Results

3.1 Optimization of fitness path

As mentioned above, the overall layout of the national fitness path is not evenly distributed, and the number of facilities installed cannot meet the rapid growth of urban community needs. Therefore, it is necessary to adjust and supplement the existing fitness path. Assuming that the new sports facilities are built in uncovered communities, there are 5 candidate locations and up to three new sports facilities. The "New Location Assignment" is used to select the location of the new sports facility. According to the principle of shortest path distance and maximum area coverage, the total distance from the community to the newly added sports facilities should be kept to the minimum, and the community should not exceed 100 meters from the fitness path facilities. Therefore, the "minimize impedance" method is chosen, the number of selected facilities is set to N, and the impedance is interrupted to 100 meters. Solve and find the best location to complete the optimization of the fitness path layout.

3.2 Status of fitness path layout

The overall layout of the national fitness path is clustered. The center of the city forms two commercial street centers, and the number of distribution from the center to the periphery is decreasing. The service range of each fitness path placement point gradually becomes larger, and the corresponding accessibility level is gradually reduced. Overall, the layout of the fitness path is highly positively correlated with population distribution and community development maturity. However, in some settlements, the configuration of the national fitness path lags behind the development of urban communities. In the future, it is still necessary to vigorously popularize and scientifically configure fitness path facilities to ensure the realization of the goal of equalizing the national fitness program and public sports facilities resources.

4 Discussion

As an important part of service facilities for public sports, the path of national fitness plays increasingly important

role in meeting the physical and fitness needs of urban and rural residents and improving the physical quality of the whole people. As the coverage of the nationwide fitness path in the city continues to expand, more and more residents in urban community enjoy the convenience of the national fitness program. However, it is still in the initial stage of development, and the fitness path has problems such as uneven inter-regional allocation, improper use, and poor management. In the case of insufficient overall allocation of public service resources in China, how to make the spatial layout of sports service facilities more scientific and reasonable, and to achieve equal allocation of public resources is of great significance. Therefore, this study will take the perspective of sports geography and take the optimization of spatial layout as the starting point to analyze how to achieve equalization of resources for the national fitness path in configuration process of the urban community.

5 Conclusions

In this paper, firstly, by studying the relevant basic theories of urban spatial layout and ecological construction, the method of urban spatial layout that integrates natural ecological elements is discussed. Then, it summarizes the basic characteristics of the spatial layout of urban natural ecological elements and fitness paths. In the end, the interaction between urban natural ecological elements and fitness path layout is analyzed, which provides some theoretical support for exploring the planning of the national fitness path in the future.

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