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Research on landscape quality of country parks in Beijing as based on visual and audible senses

Tong Qi*, Guoqing Zhang, Yajuan Wang, Chuanan Liu, Xueying Li

Department of Geography, College of Resource Environment and Tourism, Capital Normal University, No. 105, North Road of West Three Ring, Haidian District, Beijing, China

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ABSTRACT

Construction of Chinese country parks has been developing quickly in recent years, but less effort has been made in the field of esthetic quantitative evaluation of landscape of the country parks. Based on the theories of landscape esthetics and psychology, this paper constructs a landscape quality evaluation model for the country parks by means of SBE and SD methods, with which the authors of the paper carried out the research on and evaluation of the landscape quality of four selected country parks outside the Fifth Ring Road in Beijing. The purpose of this paper is to further put forward suggestions for a better development of the landscape of the four country parks in order to bring their landscape and recreation functions into full play. The findings of this paper indicate that both natural and artificial landscape characteristics exercise either positive or negative influences on landscape quality; among them the effect of vitality, color richness, senses of both joy and beauty are the key elements affecting the attraction of the country park's landscape. Country parks boast with special significance because of their localism, naturalness and tranquility. These advantages are fully shown in their sufficient space for waterscape construction and conspicuous effect on landscape as reflected from the green belts previously constructed. Nevertheless, three major problems existed in the country parks including insipid color, over artificialized parkways, and peripheral high-rise buildings in the nearby neighborhood that have also given rise to visual interference. Recommendations for relevant landscape construction and protection of the country parks are suggested.

1. Introduction

1.1. Description of study area

Country park has been proved not only a vital component of urban green space system, but also an important green infrastructure beautifying landscape for a city as a whole. It is believed that there exist a number of problems in relation to landscape construction of the current country parks after field investigations have been conducted in almost 20 country parks in Beijing: natural landscape inside the parks seems to be monotonous; there is limited variety of tree species; landscaping does not keep pace with transformation of the property of green belts. Roads in these parks appear as too wide and crowded; pavement material is out of tune with the landscape; high-rise buildings outside parks are too showy, which have greatly reduced the naturalness and wildness of landscape in the parks, affecting to a great extent both the landscaping and recreation in the parks. The present research is carried out with a view to objectively evaluating the landscape quality of the country parks, accurately expressing landscape demands of the people, explicitly reflecting current landscape status quo of the country parks, so that construction of the country parks in Beijing would significantly look up in the future.

Since large-scale construction of the country parks in the first green belt in 2007, Beijing has built 50 country parks open to residents free of charge. They receive annually about 22.3 million visitors, providing in an increasing way nice and good relaxation and recreation environment for citizens (Qi et al., 2010). Distribution diagram of the country parks (Fig. 1) shows that the country parks between the Fourth and Fifth Ring Roads are the most intensively concentrated; quantity of the country parks located beyond the Fifth Ring Road comes in the second place and those country parks between the Third and Fourth Ring Roads are the fewest. This paper picks out country parks at four different locations outside the Fifth Ring Road for research samples, i.e. Dongxiaokou Park in Changping District in the north, Lüdi Park in Fengtai District in the west, Nanhaizi Park in Daxing District in the south and Jintian Park in Chaoyang District in the east. Dongxiaokou Forest

* Corresponding author.
E-mail address: qitongdi@vip.sina.com (T. Qi).

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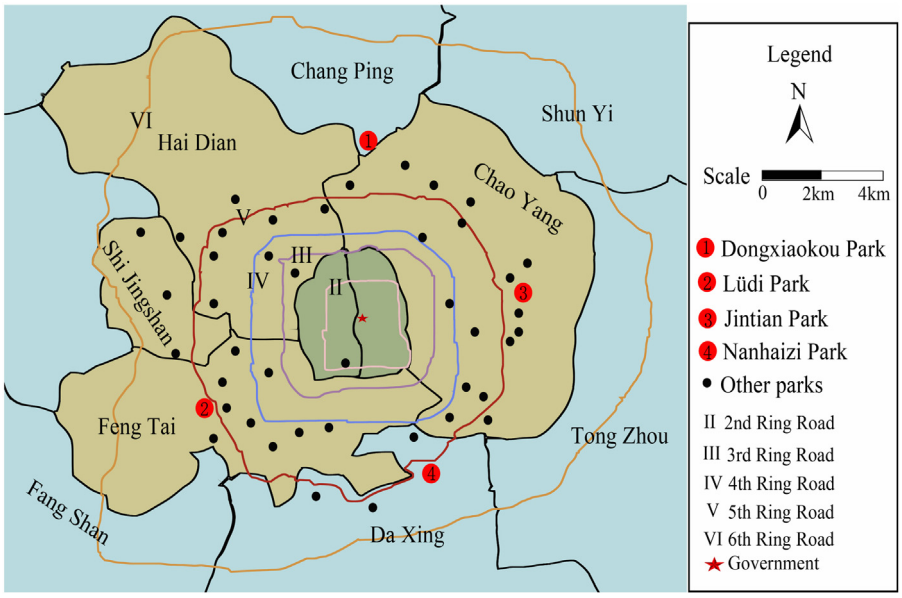

Fig. 1. Distribution of country parks (data is sourced from capital landscaping government network).

Park is furnished with lakes and sand beaches in addition to the presence of fresh air, flowers, grasses and trees all around, bringing about an atmosphere of tranquility, and therefore, visitors now feel it a good place to fully enjoy the pleasure of nature, and people say the park is like a natural oxygen bar located among high-rise buildings. Lüdi Park, which is considered one of the largest country parks in Beijing for the present, is located by the Yongding River in Fengtai District, whose green area accounts for over 95% of the total, and many peculiar and rare plant species, such as *Chinese pennisetum*, *Calamagrostis epigejos*, *Achnatherum splendens* and others are found growing here. Jintian Country Park highlights nature, wildness and biology, tall trees, arbors, flowers and shrubs, with multispecies plants being cultivated here, producing a landscape effect of "Three Seasons Abounding in Flowers While Trees Remaining Green throughout the Year". And now the existing ditches are turned into sinuous streams to partially form open water, and in the meantime, aquatic plants and hygrophytes are planted. Built in the park are the wood plank roads on which visitors are seen walking to the riverside, forming a poetic country scenery. Nanhaizi Country Park aims at a combination of natural and wild site with wetland landscape, which would hopefully render recovery and improvement to biological diversity, naturalness and integrity of Sanhaizi area, and the vision of which would also inherit the historical context of "Autumn Wind in Nanhaizi", one of the ten famous scenes in the Ming Dynasty (1368–1644 AD), with both ecological principles and protection concepts implemented in the landscaping plan and designing.

1.2. Review of evaluation methods

Landscape quality actually implies both "Visual and Audible Esthetic Quality". In the 1960s and 1970s of the last century, Europe, America and other developed countries began concurrently launching researches on landscape esthetics resources, etc., and issued correspondingly related laws and regulations to strengthen environmental protection with increasingly stronger awareness in this respect (Brown et al., 1986; Ortolano, 1984; Zhou, 1995). Meanwhile, researches on theories and methods of landscape evaluation were also conducted and four different schools with various kinds of cognition related to landscape the quality came into the world: specialist school emphasized formal beauty; psychological school took landscape esthetic appreciation as stimulation–reaction relationship; cognitive school considered the theory of evolution a guiding theory; and empirical school laid emphasis on social cultural attribute of human beings (Yu, 1987). Methods of the landscape evaluation consist mainly of Scenic Beauty Estimation Method (SBE), BIB-LCJ, Analytic Hierarchy Process (AHP), Semantic Differential Method (SD) and Physiological Psychology Index Testing Method (PPI), etc. Most scholars considered SBE the most precise and rigorous method for landscape evaluation, and it was environment psychologists Daniel and Boster of America (Daniel and Boster, 1976) that put forward SBE in 1976, as based on the psychological theories that clearly expressed the relationship between landscape and beauty appreciation as the relationship between stimulation and reaction, advocating that common esthetic taste of the group should be taken as the standard balancing landscape quality, and SBE value should be considered to be ideal scenic beauty representative value without influencing the judgment standards and score system (Daniel and Vining, 1983). Some scholars made quite a number of practical researches with SBE method: Hull et al. applied such method to verification of major differences in terms of landscape on-site evaluations, and evaluations with pictures being taken for the medium (Hull and Stewart, 1992); Clay and Smidt gave analyses of the quality of landscape in four aspects involved in naturalness, vividness, diversification and uniformity (Gary et al., 2004); starting from factors affecting landscape perception, Tempesta evaluated historical landscape of plain agriculture in Veneto Region, Italy, and established mathematical model for landscape esthetic quality (Tempesta, 2010); through researches on green space landscape in residential areas, Zhou proposed that no matter how beautiful the landscape as a whole was or not, landscape itself could not be shown with independent factors. However, it is difficult to quantify the combination relationship of factors in the process of actual evaluation, a presumption which needs to be constantly explored (Zhou et al., 2006); researches like Wang et al. also proved that different tested groups had general consistency in esthetics, but the relevance of professional groups was better, and the consideration of landscape elements was more rigorous, with the standards being considered higher (Wang and Peng, 2011).

Semantic Differential Method (SD method for short) was a kind of psychological determination method put forward by C.E. Osgood in 1957, which was also named as feeling record method. It deter-