

Study on the Functions and Design Techniques of Urban Parks in the Context of Post-1949 Urban Development

- Case Study of Xi'an, China

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Abstract: The urban park is an important part of the urban green space system and an essential factor in promoting sustainable development and urban transformation. The functions and corresponding design methods of urban parks also reflect the background and development requirements of different periods. In response to the requirements of urban development in different periods, parks in Xi'an have gradually changed from a single function of recreation to a function of cultural exchange and, in recent years, to a function of habitat protection. In order to better discuss and analyze characteristics and provide inspiration for further study, the article aims to divide the period from 1949 to 2020 into four stages according to the historical background, and make a comparative analysis according to the corresponding overall planning requirements and examples. The study will combine data with field visits to representative parks from four periods and analyze the relevance of their design and impact to the requirements of the times. The renovation of ancient gardens lays the foundation for the construction of parks, the protection and development of cultural heritage sites increases the role of parks in cultural construction, and the development and construction of ecological wetlands increases the function and role of parks in the construction of ecological civilisation. It can be concluded that the function of the park is also correspondingly related to its design approach.

Keywords: Urban Park, park function, design method.

1. Introduction

The urban park is an important part of the urban green space. As a public place, parks always play a necessary role in providing residents with an opportunity to relax and get in touch with nature [1,2]. In addition, with the promotion of the concept of sustainable development, some parks at this stage are no longer limited to the traditional concept, but are closer to the concept of ecological protection areas [3]. The research is based on the planning and development of urban green space in Xi'an in different periods. The "urban park" studied in the main body of this paper belongs to the "park green space" of the G1 category [4] of urban green space.

The formation and development of green space in Xi'an urban park represents the universal characteristics of green space construction in China. At the same time, the historical and cultural background of Xi'an and its urban spatial pattern make the construction of park green space different from other cities. From 1949 to the present, Xi'an City Park has gone through a process of large-scale and high-quality development from a small number and small scale. The study will be based on the development of urban parks in four stages: 1949-1978, 1978-2000, 2000-2010 and 2010-2020 to comprehensively discuss the changes of park functions and design techniques. The aim is to clarify the development law of the park and provide reference value and inspiration for further research in the future. The study takes Xi'an Park as an example to clarify the regularity of park development, which has profound reference value for other cities.

2. Case Study on Xi 'an Parks

In the study, four urban master plans or urban green space plans from different periods are selected as guiding ideologies, and four typical park cases are compared and analyzed in combination with the background of the times.

2.1. Early Years of the Founding of the Country (1949-1978)

In 1952, Xi'an was listed as one of the first key construction cities in the country, and at that time the corresponding urban plan was implemented, the fifth of which was the city's park and green space planning [5]. On this basis, the "Xi'an City Master Plan for 1953-1972" was drawn up at the end of 1953. At that time, Xi'an's green space planning was in its basic stage.

2.1.1. Overall Planning and Requirements

During the First Five-Year Plan, the people's enthusiasm for work was high, and after the first Constitution of the People's Republic of China promulgated in 1954 stipulated that "workers have the right to rest", the construction of "cultural rest parks" was carried out in a comprehensive manner throughout the country [6]. During this period, the Party and the government encouraged the people to participate in the construction of the park, and the park at that time was a place for the people to rest and cultural exchanges [7,8,9]. At present, there are three urban parks in Xi'an, of which Xingqing Park attracts more residents due to its special location.

For Xi'an, due to the lack of professional master planning and sufficient financial support, according to "Xi'an City Master Plan 1953-1972", the government decided to build some nurseries first, and then expand and repair them into parks [7,10,11,12]. Although these parks were built on the site of a historic site, the remains of the site have long since disappeared, so the new spatial layout has no relevance to the historical pattern of the site, but only the name of the park or the main building to evoke memories of the historic site [5,7,9]

2.1.2. Typical Park Construction

Xingqing Park was built in 1958 on the site of the Xingqing Palace and is now become the oldest historical and cultural site park in China [13]. Xingqing Park is located in the eastern part of Xi'an City, opposite the famous Xi'an Jiaotong University. The construction of Xingqing Palace also provided an exclusive leisure and entertainment venue for the the university's teachers and students [14].

As an urban comprehensive park that integrates site protection, cultural entertainment and displays the charm of the Tang Dynasty [15], Xingqing Park not only enriches the city's tourism resources, but also enhances the city's image and attractiveness. In addition, the existence of the park improves

the surrounding ecological environment, provides green space, and also improves the quality of life of residents [16]. Nowadays, Xingqing Park is still a popular resting place for Xi'an citizens, and its unique garden-style architecture and vegetation style have also attracted many tourists, thus promoting the development of the surrounding commercial and service industries.

During this period, urban development and green space planning in Xi'an continued to develop, but there is little concrete evidence. By 1978, the number of parks in Xi'an was only six [7,10,11], including Xingqing Park, an increase of only three compared to 1949, indicating that Xi'an was making progress in park construction during this period, but was still lagging behind.

2.2. Reform and Opening-up Period (1978-2000)

During the Cultural Revolution, "gardens", "parks" and "greenery" were destroyed to represent feudalism and Western capitalism, and progress in Xi'an Municipal Park came to a standstill [8,9]. After 1979, with the implementation of the reform and opening-up policy, China entered a new period of development in which people's minds began to be active, and many facilities were reopened [8].

2.2.1. Overall Planning and Requirements

In 1980s, the mayor of Xi'an organized and vigorously promoted the construction of urban environment during this period. The "1980~2000 Xi'an City Master Plan"[17] shows that the main ancient buildings and ancient ruins that remain in history should be used as the scenic spots of the artistic layout of the urban space and the opposite and end scenes of the main roads, and planned as green land [7,17].

At that time, the urban green space planning focused on the organic combination of cultural relics and monuments with public green spaces. At this time, Xi'an chose to rely on historical buildings and combine cultural relics to open up scenic spots [7,8].

2.2.2. Typical Park Construction

During this time period, the Xi'an City Wall Construction Committee was set up to build Huancheng Park. Completed and opened in 1983, the 14.6 kilometer scenic belt has become the core park of Xi'an City, with 36 entrances, and some small functional gardens are planned [7]. Although it is a linear and strong ribbon space, the park still adopts the traditional gardening techniques, free style planting of forest belts, as well as pavilions, rockeries, etc., in the early stage of completion, it is obviously incompatible with the solemn and regular military defense function of the city wall, the city moat, but it is accepted by the general public, the Huancheng Park symbolizes the pride of Xi'an citizens, and the forest belt and the city wall constitute the landmark landscape of Xi'an[7,8].

The construction of the Huancheng Park aims to preserve and display the historical features of Xi'an's ancient city wall [18], and to improve the quality of the city's ecological environment by increasing the area of green space [19]. As a ribbon park surrounding the city wall, it connects many residential areas and transport hubs, playing a fundamental role not only in rejuvenating historical sites, but also strengthening communication and connection between communities and enhancing social cohesion [20].

2.2.3. Comparative Analysis

Compared with the previous period of Xingqing Park, although both are built on historical sites, the former is only to commemorate the lost ruins[21], and the latter is to better protect and develop well-preserved ancient buildings[22]. However, for the similarity, the history and culture have been displayed and passed on in different ways through the parks 'construction. As for the function of the

park ,Xingqing Park, in addition to the similar relaxation function, also considers the cultural and educational function, while Huancheng Park plays more attention to improving the health and living environment of the residents.

So far, the construction of parks in these two periods has provided valuable experience for the development of urban parks in Xi'an [23]. At the same time, the construction of characteristic urban parks has enhanced Xi'an's urban image and competitiveness, attracted more tourists and investment [21,22], and further improved the coverage of urban green space, laying the foundation for future development [16].

2.3. Early 21st Century (2000-2010)

This stage is in the period of socio-economic transformation, in order to better improve city competitiveness and promote urban comprehensive development, urban planning focuses on improving the quality of the urban ecological environment and creating the character of the city [8,24].

2.3.1. General Planning and Requirements

Under the background of national cultural rejuvenation and urban cultural awareness, the urban construction ideas of Xi'an have gradually become clear. In accordance with the relevant provisions of the "Xi'an City Master Plan 1995-2010"[25] and the "Regulations on the Protection of Xi'an Historical and Cultural Cities"[26], the Xi'an government decided to combine humanistic construction with natural construction, and to lead the ecological construction of the park with the cultural industry as the leading force, so as to achieve the goal of highlighting cultural traditions and enhancing the competitiveness of the city.

At that time, ruin parks began to appear one after another, and their main design methods were to reproduce the original construction pattern of the ruins through the design techniques of key architectural rehabilitation and the use of modern elements, protect their historical authenticity, and fully preserve the sense of scale and image of the historical style[6,8].

2.3.2. Typical Park Construction

Built in 2010, the Daming Palace National Heritage Park is one of the most well-preserved royal palace ruins with its large scale and complete shape[27]. As one of the first national archaeological site parks in China, compared with other heritage parks in the same period, the construction of Daming Palace National Heritage Park emphasizes the support of scientific planning and archaeological excavation data, carries out a more scientific and complete protection display of the site, and formulates a greening plan according to local conditions[28].

In terms of function and objectives, Daming Palace National Heritage Park is not only a simple heritage protection project, but also integrates culture, tourism, commerce and leisure services, aiming to expand its influence in culture, economy and society through in-depth development[29]. This differs from some other heritage parks which may be more focused on a single function or conservation purpose[28,29].

Through scientific planning and archaeological excavation, the Daming Palace National Heritage Park not only protects the site itself, but also enhances the public's understanding and awareness of Tang Dynasty culture through innovation in display methods[30,31], and provides important historical material materials[31].

As an important milestone in the field of cultural heritage protection in China, Daming Palace not only carries out a unique continuation and display of the city's historical context[29], but also attracts residents and a large number of tourists because of its large-scale, complete form and excellent green design, creating the image of Xi'an as a famous historical and cultural city[29,30].

2.3.3. Comparative Analysis

Compared with the previous two parks, although the site of Daming Palace National Heritage Park is also related to the historical and cultural relics of the city, it is better preserved than the cultural relics and monuments of Xingqing Park, and it is also richer than the historical and cultural heritage of Huancheng Park[13,23,28].

Daming Palace National Heritage Park is an important force in shaping the image and characteristics of the city. Compared with the Huancheng Park, the leisure and entertainment functions are only one aspect of its overall development, and is not emphasised[23,28,29].

Compared with Xingqing Park, which is also a place for cultural activities, Daming Palace National Heritage Park focuses more on the inheritance and protection of history and culture, rather than the exchange and dissemination of real-time political and cultural information[13,28].

From 1949 to 2010, the development of Xi'an City Park went through a process from restoration and reconstruction to rapid development and diversification of functions. During this period, the layout of Xi'an City Park was gradually improved to include not only the traditional leisure and recreation functions, but also added multiple functions such as culture, education, and ecological protection. The construction of parks in this period also reflects the protection and use of historical and cultural heritage, as well as the importance of improving the ecological environment of modern cities[14,15,24,32]

2.4. Steady Modernization Development Stage(2010-2020)

With the progress of ecological civilization construction, urban planning has begun to pay more attention to ecological protection and sustainable development. This is reflected in the major changes in territorial spatial planning, which emphasises the concept of ecological priority and green development [33].

At present, the planning of the green space system not only pays attention to ecological protection, but also considers multiple functions such as scenic recreation and security protection, forming a diversified functional system such as ecological conservation subsystem, scenic recreation subsystem and security protection subsystem [34].

2.4.1. Overall Planning and Requirements

Since 1953, Xi'an has issued four editions of the overall urban planning guidelines, although there are no more refined and specific planning guidelines in recent years, according to the official "2018-2030 Xi'an Urban Master Plan"[35] which was revised in 2017, the overall planning idea is still clearly visible.

With the deepening of the concept of sustainable development, the role of urban green spaces has become increasingly prominent, and the main point of planning at this stage is to "give priority to ecology", build a "large park system", promote green space protection through park construction, and build ecological demonstration parks.

In 2011, Xi'an successfully hosted the World Horticultural Expo, and with the establishment of a national ecological garden city and a national forest city as the starting point, a number of ecological conservation parks, such as Chanba National Wetland Park, have been built one after another.

2.4.2. Typical Park Construction

In order to restore the regional ecological environment, adjust the regional microclimate and improve the quality of urban ecological protection, the construction of the park will take ecological landscape

architecture as a guideline, and improve the quality of the ecological environment in combination with its natural resources and the original environment[36].

However, at this time, another type of park is breaking through the conceptual limitations of traditional parks and becoming the new mainstream, that is, the construction of ecological demonstration areas. As a demonstration area of ecological construction in Xi'an, Chanba Ecological Zone gives priority to the construction of ecological environmental infrastructure in the ecological zone through environmental restoration, embodying the design concept of a low-carbon ecological city[37]. As the main part of Chanba Ecological Zone, Xi'an Chanba National Wetland Park can be a typical example.

Established in 2013, Xi'an Chanba National Wetland Park is rich in animal and plant resources, has high biodiversity conservation value[38], and is an important species bank and gene bank in Xi'an. It contains a large area of water, which provides a good environment for animal reproduction and habitat[38]. At the same time, it is also the central route of one of the three major migratory bird flyways in China[39], which plays an important role in restoring the biodiversity of wetlands in the Chan, Ba and Wei River systems, improving environmental quality and ensuring urban ecological safety[38,39].

2.4.3. Comparative Analysis

Due to the different natural conditions and functional priorities of the park, Chanba National Wetland Park pays more attention to the protection and restoration of the ecological environment, so compared with the ordinary vegetation planting and landscape design of the park in previous stages, the environmental restoration and management methods of Chanba National Wetland Park are more professional, and a variety of measures have been adopted, such as wetland habitat restoration and construction strategies, and the establishment of a protection management system [40].

Chanba National Wetland Park has obvious characteristics in water system design and plant landscape construction. For example, through the design of water recycling, waterfront design, and aquatic plant community configuration methods, a unique water landscape has been formed[39,40]. At the same time, the ecological function and ornamental value of the park are enhanced through the careful design of plant communities, such as the selection of native tree species suitable for local climate and soil conditions[40,41]

By the end of 2017, Xi'an had 103 parks, 100 and 97 more than in 1949 and 1978 respectively, successfully creating a "national forest city". As of 2019, Xi'an City has formed a large park era pattern with large parks in four directions: east, west, north and south.[42,43]

3. Conclusion

Urban park is an important issue in the development of urban green space. Taking Xi'an as an example, this study combined the analysis of typical cases and data support to discuss in depth the differences in the development requirements, functions and design techniques of parks in different periods after the founding of the People's Republic of China. The study reached several important conclusions: (1) the goals of the urban master plan affect the focus of the urban green space planning, which in turn determines the construction function and location of the park; (2) the design approach of urban parks will change depending on the conditions under which they are built and the function of the park; (3) the construction of parks and the development of the city complement each other, most of the park construction in Xi'an is closely related to its urban characteristics and existing historical and cultural conditions, and the construction of the park has also created urban characteristics and established the image of the city to a certain extent. However, the study only focuses on urban parks in Xi'an, and only selects four parks as typical cases, so the conclusions are not applicable to all cities and countries

due to their peculiarities. Therefore, it is necessary to combine big data, extend the research stage, and conduct comparative analysis and further discussion in multiple places to explore the more comprehensive development characteristics and changes in park functions and design methods.

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