Study on the Sustainable Development of Space in Post International Horticultural Exhibition Age from Urban Perspective

Chenglin Gao*1
1 PHD. Teaching in the major of environmental design in School of Landscape Architecture (Beijing University of Agriculture), Beijing, 102206
*Corresponding author, e-mail: chenglingao @126.com

Abstract. International Horticultural Exposition is regarded as the "Olympic" event of horticultural culture and garden science around the world, moreover, the "harmonious symbiosis between city and nature" advocated by the Expo is the important embodiment of urban ecologicalization and also the harmonious link between city and nature. In this study, the environment landscape of International Horticultural Exposition is put under the background of city and nature, then combing and summarizing the effect of Expo development on the construction of green human habitation. At the same time, combined with the current situation of the developing experience of Beijing International Horticultural Exposition in 2019, this paper proposes that promoting regional value in natural resources of city plays a leading role in the sustainable development of space during the Post-International Horticultural Exposition Age, the construction of ecological community environment after the Expo will be a platform to alleviate and coordinate the contradiction between city and nature and it also can promote the integration of these two parts.

1. Introduction
Modern large-scale international exhibitions are playing an increasingly important role in economic, cultural and technological exchanges around the international range. The International Horticultural Exposition (hereinafter referred to as the "Expo"), as the material carrier of "major events in city", has assumed the functions of inheriting horticultural culture, popularizing science education, demonstrating ecology and protecting environment, so it plays an important role in regulating and actively promoting the construction of natural resources in cities. At the macro level of the city, it influences the formation of green space system around the city range, and realizes the regional coordinated development through site selection and planning. In the past decade or so, China has held many world-class events with large scale and A1 horticultural events. Seeing from the Olympic Forest Park, the International Horticultural Exposition as well as the 2022 Beijing Winter Olympics under construction, it can be clearly known that the construction of major event landscape in cities not only increases the ratio of large-scale green space in Beijing, but also plays a positive role in optimizing and upgrading the tourism industry of host countries and cities.[1] Moreover, it enhances the development of urban tourism industry and the comprehensive carrying capacity of urban services. With the hold of the Expo, the applied materials are more environmentally friendly, the technology becomes more energy-efficient, and the design pattern tends to be low interference mode that complies with the nature. Therefore, later utilization of the Expo Park is also an important part of the development and construction of International Horticultural, which not only can promote the development of tourism industry as well as local civilization construction in host countries and cities,
but also have far-reaching significance in giving full play to the economic and social benefits brought by the Expo.

2. Impact of The International Horticultural Exposition on City

2.1. Major Characteristics of Urban Events
Urban ecologicalization is the highest level of urban development, and urban ecologicalization emphasizes the coordinated development of society, economy, nature as well as the overall ecologicalization, that is, realizing the sustainable development mode of harmonious development and symbiosis between human and nature. In contrast to other types of major events, the Expo has the greatest relationship with the development of urban green space, since it makes the greatest application of ecological materials, technologies and design patterns in green space. The “negative” quit in planning of urban infrastructure space is affecting the cognition of green space in large urban parks and the general small open green space.[2] By relying on the gardening events, planning area can restore the polluted land in cities and make use of abandoned lands, so as to keep the large space of green land for the city after exhibition, thus improving the urban environment, increasing the development value of that region, and also promoting the structural layout of the whole city.

2.2. Green Urban Network Frame
As an important driving force of urban construction, the Expo is closely related to the construction of regional green network in urban area. Through selecting previous Expo cases that took green development as the theme of city park and analyzing the relationship between site selection and cities (see Table 1), we can find that the site selection of Expo gradually develops from the edge of urban core area to the urban suburbs, which optimizes the traffic space in urban area and accelerates the construction speed as well as the development and utilization speed of new urban area. In addition, this change promotes the development of surrounding emerging areas.[3] In recent years, driven by the concept of modern urban development, the regional planning of Expo has been linked to the forming process of urban green network, which becomes a medium in constructing urban green network through the holding concept of "harmonious symbiosis between city and nature".

| Names of Expo | Time | Theme                                           | Site Selection                     | Subsequent Space Utilization       |
|---------------|------|-------------------------------------------------|-----------------------------------|-----------------------------------|
| Kunming Expo  | 1995.| Human and Nature - Step Toward the 21st Century| Jindian Scenic Area               | Theme Park                        |
| Shenyang Expo | 2006.| We Live in Harmony with Nature                  | Shenyang Qipan Mountain Scenic Spot | Theme Park                        |
| Xi’an Expo    | 2011.| We Live in Harmony with Nature                  | Xi’an Chanba Ecological District   | Urban park, integrated development|
| Jinzhou Expo  | 2013.| City and Sea, Harmonious Nature                 | Longqiwan New District, Jinzhou   | Urban Park, Urban Green Land      |
| Beijing Expo  | 2016.| Green Life, Beautiful Homeland                  | Yanqing County, Beijing           | -                                 |

(Table source: Drawing by the author)
2.3. Sustainable Urban Development Effect

After analyzing the subsequent utilization of excellent Expo parks at home and abroad, it is found that the sustainable city development mainly concentrates in carrying out garden-type greening construction in cities, which mainly focuses on the grasp of urban land use and spatial pattern, more on the major standard of pursuing form and visual aesthetic feeling[4]. All of the Expos under analysis can be divided into three categories, the first one is transforming the Expo Park into theme park for development and utilization; the second one is to provide service for urban residents in the way of urban park or urban green land; the last one belongs to comprehensive development and utilization, which preserves part of Expo areas as urban green space from the perspective of urban comprehensive development, and the other sites are used for secondary construction, introducing new functions to promote the fusion of city and Expo.[5] The conditions mentioned above are specifically shown in following aspects (see Table 2).

Table 2. Analysis on the sustainable development direction of Expo

| Development Direction | Park Green Land | Tourism Industry | Secondary Urban Development |
|------------------------|-----------------|------------------|-----------------------------|
| Classified use         | Public green land for leisure | Theme park | Urban new area | Leisure service | Ecological industry |
| Planned patterns       | Improving urban green space system, providing public leisure space, perfecting urban public environment and promoting communication among citizens | Promoting development of urban tourism and providing new sightseeing spots | Constructing as a developing land and new district | Restoring old urban areas and abandoned sites | Green land development and land use |
| Location Direction     | Green land for park, planning land use | Green land in suburbs, botanical garden and surrounding site land use | Land for future development in urban plan | Urban abandoned areas, old areas | Urban land to be developed |

(The Table source: Drawing by the author)

3. Evaluation on the Experience of International Horticultural Exposition from the Urban Perspective

3.1. City Orientation of 2019 Beijing Expo

2019 Beijing Expo was Located in the southwest of Yanqing County, it is close to Yanqing New City in the east and Guanting Reservoir in the west, stretching over the Gui Shui River, there are about 10 kilometers from Badaling Great Wall and Haituo Mountain. The total area of Expo park is 960 hectares, with “green life, beautiful homeland” as the core concept in planning and design, so that forming the planning structure of "one center, two axes, three belts and many districts" (see Figure 1).[6] By building the "horticultural industry gathering area", "international ecological leisure resort", to accelerate the transformation of Yanqing city, so as to make it become the ecological sub-center of Beijing.
The park of 2019 Beijing Expo retains the city orientation of Yanqing's "modern horticultural industry gathering area". Through the policies of leisure agriculture, tourism supporting resources, science and technology projects, landscape upgrading and so on, it integrates wetland as well as a large number of forest land and macrophanerophytes in the whole park range to reflect the texture of present village settlement.[7] Focusing on planning the ecological waterway that combines water quality improvement, rain and flood control, provision of non-traditional water supply as a whole; through increasing native tree species that are suitable for growing, the construction mode of natural community is formed, so as to make the park structure become a community system with rich structure and stable ecological function. In order to realize the 3R treatment of garbage in park, the green ecological building technology with extremely low energy consumption is adopted in the construction of stadiums and supporting facilities.

3.2. Regional Value of 2019 Beijing Expo
The park adheres to Yanqing’s function of “ecological conservation area of the capital”, so the forest coverage of the whole park is expected to reach more than 59.5%, which will significantly enhance achievements in ecological construction. The transformation of ecological environment has driven the economic growth of Yanqing, and the comprehensive income of tourism industry has increased by 30% year on year.[8] At the same time, economic drive has strengthened the city’s comprehensive carrying capacity of Yanqing. At present, the total investment in fixed assets of Yanqing has reached to 54.5 billion yuan, with an annual GDP growth of 8.2%, the construction of infrastructure and public services tends to be perfecting. The external transportation network of three highways, one high-speed rail and one suburban railway built in the region has broken the bottleneck of urban transportation, which has restricted the development of Yanqing all the time. In particular, the horticultural industry of Yanqing develops rapidly this year, 46 new horticultural enterprises were established in the park. At the same time, the influence brought by city brand of Yanqing and civilization construction of park have been generally promoted.

3.3. Follow-up Integration of 2019 Beijing Expo
Strengthening the construction of residential areas with green public service, providing important public green leisure space for local residents, most exhibition facilities and venues during the Expo are retained for the service construction of public gardens. Residential landscape space can be developed as a new multifunctional community service organization and a new urban green public space network, so as to lay a solid foundation for better ecological living environment. Inside the landscape community, we can combine the life and artistic experience of citizens together to coordinate the spatial balance system between order and non-order in the garden, accordingly improving the innovation of various ecological science and technology industries in urban construction. Paying more attention to the linkage with Winter Olympic economy, Great Wall tourism, Si Ji Hua Hai and other leisure tourism industries, with the concept of touring in whole region to strengthen the management of new format mode, thus creating leisure tourism that covers the whole north part of Beijing.
4. Recommendations for Sustainability of Space in Post-International Horticultural Exposition Age

4.1. Strengthening the Pilot Area for Intelligent Management

Industries that enter into the park need to comply with ten major high-end requirements in Beijing. As interpreting the “Opinions on Land Use Policies of Accelerating Technological Innovation and Constructing High-end Economic Structure”, this study found that the development suggestions for Yanqing District are mainly inclined to the direction of new energy, energy saving, environmental protection and intelligent equipment. Therefore, the development of high-tech industrial park in this region focuses on promoting the deep integration of new energy, new material, artificial intelligence and industry application. In face of intelligent city, intelligent life and many other fields, Beijing should cultivate leading enterprises with strong technical ability, high service level and strong driving ability, especially the native "cloud ecology" enterprises which can be developed in Beijing. In the formation of big data innovation business format, it is necessary to establish the “cloud ecology” lifestyle in medical cloud, traffic cloud, education cloud, etc.
4.2. Promoting Planning and Construction of Green Community

Building a public service space for green landscape planning and community function to provide important green leisure space for local residents, during the period, most exhibition facilities and garden planning space are retained for service function. Combining with the mode and layout of forest town construction, relying on the advantages of existing terrain landscape as well as natural and human environment, we can realize the construction of green life ecological network and expand the economic use and service function of space. In addition, the circulation system of solar energy resources, living water source and natural precipitation can be used to construct ecological residential area, expanding the communication between people and green activity space, thus realizing the green public space system network of new villages, and creating a good ecological living environment. At the same time, art and modern lifestyle should be closely combined to carry out innovative, experimental and symbolic artistic activities to enrich the ecological and cultural experience of citizens, so as to create the construction of ecological art village that takes the leading position in the world.

4.3. Opening Drive Platform of International Industries

The internationalized industrial platform should interpret the connotation of ecological civilization, that is, the social format with the basic purpose of harmonious symbiosis, virtuous circle, all-round development and sustained prosperity between man and nature, man and man, man and society. Adhering to the idea of "bringing in and going out", inviting horticultural experts or designers, university groups, pillar enterprises and other entrepreneurial innovation team from all over the world to create display and promotion platforms. Moreover, jointly holding exhibition events, international forums, scientific and technological achievements events, science education bases, high-end gardening experience platforms and other multifunctional, experimental and open exhibition halls in agriculture, technology and intelligence. Hereby achieving the high-end industries of modern education and green technology, manifesting the international vision and the capital function, thus adapting to the escalating consumption demands.

5. References

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