Discussion on the Landscape Greening Design in Special Urban Spaces When Facing Haze

--Taking Hebei Xingtai as an example

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Abstract. Based on smog, wetland destruction and other environmental problems, this paper proposes that the greening of Xingtai should not only concentrate on the essence of excellent projects and national garden city construction but also study the special spaces greening in deeper layers. This paper firstly clarify the concept of special spaces greening, basic designing principles; and then work out designing plan for the greening landscape so as to build new platform for the fourth type of livable garden city.

Introduction

When haze disturbs Xingtai and surrounding cities in special way, greening, as the only livable infrastructure, has been the precious method to breakthrough haze for designers. Since 2008, Xingtai has proposed to build up consciousness for the best during the garden greening and issued the Enforcement Regulations for the Delicacy Management of Urban Greening; and strived to realize the "Tree-lined type, landscape type, ecology type, leisure type" livable city delicacy landscape and the strategic objectives of " one landscape at a street with its own specialty"; then afterwards, it published the "Enforcement Plan for the National Garden City in Xingtai" and proposed to enforce the ecological environment construction, improve urban taste, improve citizen's living quality and promote the overall city level based on the principle of adjusting to local circumstances and building up specialties. The above-mentioned measures express high attention on greening landscape. And the development of special greening spaces provide great green potentials for the city greening and the improvement of plant biomass. For example, according to the analysis of History, Status Quo and Development Trend of Special Greening Spaces completed earlier by Shanghai Greening Management Guidance Station, the greening of five sides of a fix-floor building should be 3.6 times the spaces of the building. In a community that makes full use of the construction spaces for greening, the three-dimensional greening spaces can be 15 times the space of the ground greening. Therefore, at the same time of promoting greening landscape, Xingtai should refer to the experience of developed countries and cities and pay attention to the study and practices of greening in special spaces.

Definition and planning principles for the greening of special spaces

Definition of special spaces greening. The greening for the roof, wall, indoor, wetland and elevated road in the city is called the greening of special space, which is firstly proposed by Japan. Now, special space greening has relatively clear definitions. The first refers to the greening that is hard to realize by ordinary greening technology; the second takes the greening of spaces affiliated to building and civil engineering as greening of special spaces, including the spaces inside city, artificially built spaces, the spaces that planted cannot grow normally with common planting technology and the spaces eager to be greened.

The sustainable development of the greening urban garden is the key to the sustainable development of the city. When Xingtai is frequently bothered by haze and the quick collapse and breaking of Xingtai wetland landscape, the ecological benefits is closely related to the changes of

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the urban environment. In other words, in modern cities, the tall buildings, crisscross roads and hard roads have replaced the natural land and made the horizontal development of greening more and more difficult, which forces us to seek for solution by special spaces greening.

Planning principles for special spaces greening landscape. (1) Function perspective for sustainable development: all the greening inside the city should present the ecological functions, safety functions and views functions so as to construct the multi-functions combination and greening landscape system that adds many benefits together.

(2). Ecological perspective that can fully play the advantages of local resources. According to the local circumstance, it fully apply the conditions of Little Yellow River, Baima River, Qili River and South–North Water Transfer Project and mainly do best in water and greening so as to highlight the Xingtai landscape of mixture of static and dynamic environment and create public greening spaces with features of Xingtai.

(3). Cultural perspectives with national features. Since it inherit Taihang Mountain and Guo Shoujin and other historical inheritance, it should organically integrate the traditional Chinese gardening culture with the booming developing modern technology.

Feasible creative perspective. At the same time of playing the advantages of drought-resisting and alkali-resisting plants, it should emphasize the introduction of seed and application, establishing new plants groups and try the new mode of energy-saving greening and subsequent using.

Framework for the greening landscape of special spaces

Landscape framework for Xingtai wetland, hygrophyte and hygrophyte plants group. Based on the Baima River, Qili River and Niuwei River (for example, Niuwei River regulation project mainly aims at to drain the water inside the city and satisfy the city drainage and environment landscape requirement) etc wetlands in Xingtai, it develops the ecological project-oriented key technology study. By systematic integration and project samplings, it forms sets of technology and system plan for polluted water repairing, wetland in-situ function reconstruction and landscape.

It mainly aims to solve the plant recovery planting (below low water level) of wetland, river band (low water level- high water level) plants groups construction and plants group recovery and operation in hygrophyte forests (above normal water level) so as to recovery the Baiquan wetland systematic plants groups and waters in Xingtai. In specific, it consists of the natural technology to recovery wetlands, ecological technology of inland wetland, construction technology of native species landscape, realization technology for ecological service function of landscape wetland etc. Apart from expanding artificial waters in Xingtai, it remarkably plan and construct for the wetland so as to realize the sustainable development of wetland greening in Xingtai and create new greening and ecological tourism. In the three years of big changes, it mainly constructs the wetland garden in south suburb of Xingtai (which locates in southwest suburb and belongs to Nan Shahe and occupies 660 acres) Xingtai Binjiang Ecological garden (which locates in northwest of the city and west of South-to-North water diversion branch and covers all the land in Lima village and Zhaoguzhuang village and the overall planned area is about 13.8 m2) and promotes the above-mentioned main technologies.

Planning for roof greening landscape. It refers to special space greening of various constructions that is not directly connected with the natural soil of the ground or greening that is above the ground. It can be understood as the roof, balcony and terrace of the building, walls, bridges and flyover. The history can be traced back to the Hanging Gardens of Babylon. In recent years, America, Japan and France have adopted the roof for greening and China set foot from 1960s. In a few cities, it develops and constructs and has achieved primary study and practical results.

According to the difference of roof forms, Xingtai gradually promotes the roof greening, vertical greening theory and technology by temporarily or permanently studying different three-dimensional greening planning. On the basis of referring to the relevant greening technology of Shanghai Expo, Xingtai clarifies the big changes within three years and excellent projects as well as construction of national gardening cities under the status quo of increasing intense sunlight intensity in Xingtai. It

should fully play the greening landscape effect on the basis of protecting the original Xingtai construction appearance, which, in specific, consists of the analysis on the roof greening forms, architecture construction of roof greening and the integration technology of plants landscape, selection technology of plants suitable for roof greening.

Vertical greening landscape framework. In broad sense, vertical greening refers to the condition of not occupying or occupying little planning land for greening of the vertical or horizontal or roof of various constructions. In narrow sense, the vertical greening refers to the greening or beautifying of the vertical sides or roof of the climbing plants and this concept can be changed to climbing greening. In some developed western countries, using climbing plants for decorating walls has two or three hundred years history while China has consciously plant Creepers in the external walls of church, schools and library in cities from 1920s.

Vertical space greening can cool down the temperature, dust and voice and increase the oxygen, anion content in the air and improve the air quality and other environment or landscape benefits. According to the research, after greening, the dust of building on both sides of the street would be three times or four times lower than the street and the walls with plant coverage would be 5℃ than the walls without coverage; the indoor temperature inside the room with greening on the roof would be 3℃ lower than before in summer, which equals to an air-conditioner coat for construction. As for Xingtai with frequent haze, it should grasp the function of vertical greening under the worry for PM2.5 to finish the vertical greening plants selection, vertical greening and integration of affiliated construction and related technology, selection of proper plants for vertical greening etc.

Planning for disturbing spaces greening landscape. According to the planning requirement, Xingtai mainly promotes the greening of bridge shadow, disturbing spaces greening and factory greening, which can complete their own function and undertake the tasks of urban greening coverage rate, adjusting temperature and beautifying the urban environment. However, as for the improvement of greening from quantity to quality, the selection of shade enduring plants and community arrangement would affect the greening ecological function of bridge shadow. For example, the Central Ecological garden in Xingtai, in the east of the city, occupies 16 m2 and is the subsidence area of Xingdong coalmine; and is planned as a special plants garden with quaint appeal by combining with the city river regulation and water collection project so as to highlighting the night view inside the garden and inherit the history and promote cultural connotations.

Xingtai also takes the after-demolition greening as another focus of greening construction. It makes greening closely after demolition in Xingzhou North road, Quanbei street, Shunde road, Xinghua road, Shoujin road, Yejin road, Xingxin street, Zhongxing street, Tuanjie street and Quannan street and others and studies the selection technology for shade-resistance and dust-resistance plants according to the real situation, plants, dust, air flow analysis and plants living environment of evacuation square and then it mainly forms Guoshoujin square, New Century square, Railway Station square, Cultural square, Zijin square, library square,, Zhongxing square, Gym square, Kaiyuan Temple square, Gaoke Station square etc ten greening landscape evacuation square.

Conclusion

At the same time of promoting ordinary space greening, Xingtai emphasizes the study on special spaces greening function, greening functions etc. so as to effectively prevent the frequency of haze, promote and rebuild the Xingtai Baiquan wetland landscape features, which can make our life more beautiful and comfortable and embraces the improvement of regional environment into special space greening, thus being more close to the social requirement of sustainable development.

References

[1] M.L. Shen. Greening for special spaces--- Shanghai roof greening reached 350,000 m2. Shanghai municipal people's government's official website，Shanghai Expo.2005.11.

[2] R. Wang, K.X. Zhang & L.J. Da. Greening and measures for greening in city special spaces.The Second China Forestry Science Conference——Theory and Technology Essays for S13 city forest construction.2009.

[3] Difference and similarities for vertical greening, three-dimensional greening and greening for special spaces.http://bbs.admin5.com/thread-6254116-1-1.html

[4] X.M. Wang. Roof greening: Expansion new spaces for environmental-friendly ecology. Construction Science and Technology.2007.9.