

The Planning of Urban Green Space System and Sustainable Development

Wang, Bingluo

Chinese Society of Landscape Architecture

ABSTRACT

In order to answer the challenge that development gave to environment, Chinese cities are making up and putting into effect the green space system planning. The planning main keys are: set down standards and scope of green space; bring the characteristic of every types of green space into full play and made into basic units of the system; formed powerful links of the system; make full use of the natural system of city, constituted the urban and countryside as a organic whole green space system, therefore give full play their function and ecological effect. In fact, this green space system is a complex system: It is the main body of city ecological system, a main container of the citizen activities of leisure and recreation and a leading factor for making characteristic city landscape. Therefore it is a system carrying city's environment sustainable development.

Key Words : Urban environment, Green space system, Complex effect, Sustainable development

The 21st century was greeted with jubilation by all. Encouraged by the development and progress achieved, people have reason to look forward to the future with great faith and expectations. Landscape architects are aware that they carry the important responsibility to explore arduously for ways to plan and build a fine living environment worthy of our time. The following is a brief introduction of problems facing China's urban environmental development and some investigations and concerning these problems.

I. THE FACTS FACING CHINA'S URBAN ENVIRONMENT AND THE PROBLEMS NEED TO BE DEALT WITH

1. China has set the goal to build up a prosperous, strong, democratic and highly civilized modern country by the middle of this century. The economy has been growing at an average rate of 8% for the past few years. In order to put into effect the policy of "keeping the planning, building and implementing of urban and rural development and environmental development in step with economic development", efforts made for environmental development must be doubled.

2. A period of accelerated urbanization has arrived. Urbanization ratio in China was 12.5% in 1978, and reached 36% in 2000. It is expected to reach 50% by 2015, and exceed 70% by the middle of this century. As the population agglomerated

towards the cities, urban spaces became congested and the pressure on urban environment increased drastically. At present, there are 667 cities and 19216 towns, the above two are legally classified as cities), as well as 31,000 market towns and 3.6 million villages. All of these human living environments require to be planned and built by landscape architects.

3. The trend of deterioration of ecological environment due to industrial development in the whole country has not been restrained yet. Improvement measures must be examined and implemented from various standpoints, either local, regional or nationwide. The special status of cities dictates that they are the priority locality to be treated with persistent effort. The built-up areas in cities account for only 0.25% of the territorial area and the total area of cities account for only 2% of the territorial area. It is perfectly possible to concentrate efforts on these parts first. In 2000, the green coverage rate of all cities had reached 28.1%, which was more than the forest coverage rate of the territorial area. Its current growth rate is still high.

4. People have more time to spend at leisure. Leisure has become a kind of life style and behavior style. Especially, the growing up of a generation of only-child (increasing at more than 10 million yearly) and the advent of an aging society (people over 60 years of age had reached 10.9% of the population in 1999,) have put forth a strong demand for leisure in green space.

5. The information age requires an environment which is favorable all-around for learning, working, research and innovation, living and leisure, and which will provide the condition for rapid advance of high and new technologies and green culture. The

coexistence of the industrial age and the information age offers a golden opportunity fulfill the missions of both ages concurrently and realize the leap over of a historical stage of development. As a matter of fact, the inertia of an era is strong. To what degree can we overcome it depends on how well can our knowledge keep pace with time and how adequately can we make critical analysis on the experience of others.

There are a series of problem awaiting comprehensive research, analysis and response on our part. The prime task for landscape architects is to rebuild nature within the human living environment and to coordinate the relation between men and nature.

II. PLANNING AND BUILDING THE URBAN GREEN SPACE SYSTEM

Since 1992, in accordance with the provisions of 'Urban Planning Law' and 'Regulations for Urban Greening', cities all over the country had taken actions to great better urban environment, the core of which was the planning and development of urban green space system. These activities significantly improved the environment of some cities while at the same time raised the level of theoretical research and practical work. To sum up, the main points are as follows:

1. Sufficient Green Space Dimensions and Greenery Quality

The rebuild secondary nature must be of sufficient scope and quality in order to produce positive effects on urban environment. Cities must set down proper standards and targets according to their actual circumstances and gradually build up the projects to their full scale. Due to the large

population in China, urban land available for development is relatively scarce. This condition determines that urban green land in China can not be of very high standard. The positive effect of green land on urban environment depends largely on the dynamic role of viable landscaping plants. Therefore, every unit green space must have high greening quality (sufficient quantity of greens). Every city must prepare its own plan for the breeding, development and utilization of landscaping plants in order to cultivate communities of planting materials of fine quality and distinctive properties that are suitable to grow locally.

2. Plan and Build Various Kinds of Park and Garden at Different Hierarchy , each with It's Specific Features, to Serve as Substantial Basic Units in the System of Green Spaces

1) Public green space

As primary units of urban green space, various kinds and levels of public parks and green grounds are to be systematically distributed within the city on the basis of specific service radius. The area of these may reach 8% of land used for urban development.

2) Green space in residential areas

These green spaces have high utilization efficiency as they are close to residents and convenient to use. Green ground ratio in residential district and per person green area index should be adhered to. The area of these green spaces may account for 10-15% of land used for urban development. Their importance is evident.

3) Attached green spaces of institutional units

These are communal to a certain extent.

Different standards should be applied to institutes of different nature. If put into effect according to standards, these green spaces also will occupy a large portion of land used for urban development.

4) Productive plantation green spaces

Acting as the city's own bases to produce greening materials, these should be planned and set up according to relevant standards. More intensive use of science and technology can make these spaces efficient and multifunctional.

5) Protective green spaces

These green spaces are provided to meet sanitary, safety and protective requirements, and also for other functions as there may be.

6) Landscape forests

As backgrounds for the urban landscape, they are the media of transition between the urban area and the natural environment. Their great potential in environmental development should be fully exploited.

3. Build up Strong Links in the System

Plan road, canals, and water front green belts, rationally distributed and set up, to connect and integrate the various basic units of green space. They will serve as passages for benign circulation of air flow in the city and become landscaping belts with local characteristics.

4. Integrating the City and Its Suburb and Countryside

In China's administrative system, cities are set as centers that have jurisdiction over their surrounding counties. The improvement of urban

ecology to meet the needs of the city can be carried out by treating the city and its outskirt as a whole. The urban green space system can be knitted together closely with hills and rivers, forest land, agricultural and pastoral areas in the outskirt to form a complete natural environment. Thereby, all positive factors can be mobilized for the improvement of the ecosystem.

5. The Above Mentioned Urban Space System can be Summarized as Fellows

To fully utilize the natural conditions, geomorphic features, basic plantings (natural vegetation) and regional landscaping plants; to fully cover the various kinds and levels of planned and existing green spaces with plant communities in accordance with unified national regulations and specific standards of the city; according to certain objective law to combine these together rationally as a complete organic system; and to link up this system with local hills, forest lands, and agricultural and pastoral area to create an ecosystem that integrates the city with its outskirt. This system will act as the primary supporter for people's recreation and leisure activities, and will become the predominant factor in the cityscape.

III. A MULTIPURPOSE COMPLEX SYSTEM WILL BECOME THE ENVIRONMENTAL SUPPORTER FOR SUSTAINABLE DEVELOPMENT OF THE CITY

1. The Main Body of the Urban Ecosystem

the urban green space system links up the secondary nature with adjacent natural hills and rivers, contains major natural elements in the city,

covered with the widest range of plant species, provides habitat for wildlife, and take on the protective relocation of endangered species. This system will become an active producer for urban ecology. It will capture solar energy, promote the growth and benign cycle of living substances, and at the same time, protect water resources, conserve water and soil, and regulate microclimate. The state of improvement of urban ecological environment depends upon whether this system is effective or not. To find out, the following aspects should be examined:

- 1) The size of green spaces and the biomass they contained.
- 2) Evidence of further improvement of the urban environment, on condition that urban pollution is being controlled.
- 3) subsiding of heat island effect in the city.
- 4) Bring about the benign circulation of urban air flow.
- 5) Stability of ecosystem and the tendency of increasing or decreasing of biodiversity in selected fixed locations in the city.

2. The Main Supporter for Recreation and Leisure Activities in the City

In the wake of economic and cultural development, leisure and recreation occupy a considerable part of time in people's lives and leisure expenses take up a considerable share of the consumption market. Enjoying recreation and leisure in a pleasant natural environment has become the fashion for modern people. Urban green space system has become the place most frequented by people at leisure. All kinds of scientific, cultural, sports, social and amusement activities require to be arranged and carried out in the green space system.

This inevitable trend of development in turn will help the formation and refinement of green space system.

3. The Predominant Factor in Creating Distinctive Features of the Cityscape

The geographic structure and geomorphic features inherent in the green space system are unique to each city. Regional plants and the ecosystem they constituted possess local characteristics naturally. Historical and cultural legacies and their environment getting better, together with the landscape framework shaped by traditional scenic culture, when organized into the green space system, will fully reflect the local cultural vein and characteristics. These elements, merging, alternating, continuing and repeating throughout the city, will compose the main melody of the cityscape and highlight features unique to the city.

4. The Environmental Supporter for Sustainable Development

The sustainable development of the city is related to factors such as economy, society, population, resource, and science and technology. These factors need a common supporter---environment. The urban green environment, constituted by the green space system, with its fine ecology and highly distinctive landscape may become such a supporter. It may create a condition in which the environment and sustainable development will be reciprocal causation in producing beneficial effects.

1) A favorable environment will help to attract investment and spur economic development.

However, it will also keep economic growth within a healthy and appropriate range due to the fact that resource and environmental pressure will produce restrictive effects and environment input will take up economic gains.

2) A fine environment will advance social, economic, cultural development and social stability. The progress of social morals, the better preservation of cultural and natural heritage with their environment to be enjoyed fairly generation after generation, the coordination between men and nature, the improved ability to protect against disaster, and the sustained social development will further raise the level of environmental protection.

3) A fine ecological environment will bring about continuous improvement in people's basic qualities, thereby making possible better population control to reserve space of development for future generations. In the mean time, the environment will be better preserved and its supporting power increased.

4) Under favorable ecological conditions, benign cycles of resource flow, energy flow, capital flow and personnel flow in the city will be set up. The rational disposition of resources will result in their rational development, utilization and conservation. All these will lead to further improvement of the environment.

5) A favorable environment will provide appropriate conditions for the development of high and new technologies which, in turn, will provide sustained motive force for economic and social growth and technical means to maintain, monitor and improve the environment.

It is evident that environmental supporter has

important bearings on the overall situation of sustainable development. We must build up a sustainable environment in order to open up a clear sailing course for the “ship” of sustainable

development to reach the other shore. Thus, we believe that a wellbuilt complex type urban green space system is of decisive significance for the sustainable development of the city.

Accepted August 31, 2001

Refereed by CHSLA