

The Role of Urban Green Space System Planning in Landscape Regeneration in Ageing Cities

Wang,Min^{1,2} Zhao,Guiheng¹ Zhou,Yu^{1*}

1Sichuan University of Media and Communications, Chengdu, Sichuan 611756, China

2Universiti Kebangsaan Malaysia (UKM), 43600 UKM Bangi, Selangor Malaysia

Abstract: As urban ageing continues to intensify, landscape renewal has become an urgent need to improve the urban landscape. This paper focuses on the role of urban green space system planning in landscape renewal in aging cities. By analysing the characteristics of ageing cities, we explore the theoretical basis of urban green space system planning and delve into its role and impact in landscape renewal. Through spatial remodelling and community participation, green space system planning provides sustainable development paths for cities, while bringing about improvements in air quality and socio-economic benefits.

Keywords: Urban ageing; Landscape regeneration; Green space system planning

DOI: 10.62639/sspjiss02.20240101

1. Introduction

With the passage of time, the phenomenon of urban aging has gradually emerged globally, and older cities are facing multiple challenges, including aging infrastructure, increasing environmental pollution, and declining quality of life for residents. In this context, landscape renewal of aging cities has become an urgent task to enhance the overall image of cities and improve the quality of life of residents. The purpose of this paper is to discuss the role of urban green space system planning in landscape renewal of aging cities, so as to provide theoretical support and practical guidance for urban renewal. By analysing the theoretical basis of green space system planning, we will reveal its important role in improving the urban landscape, promoting community development and enhancing the quality of life of residents, and provide innovative ideas and feasible solutions to the problems of aging cities.

2. Urban Ageing and Landscape Renewal

(1) Characterisation of aging Cities

The characteristics of aging cities are complex and diverse, including but not limited to infrastructure aging, urban environmental pollution, and aging residential communities. Infrastructure aging is manifested in the old age and disrepair of roads, bridges, drainage systems and other infrastructure equipment, which brings considerable trouble to urban traffic and residence. The problem of urban environmental pollution has been highlighted, with the proliferation of air, water and soil pollution, posing a threat to the health and quality of

(Manuscript NO.: JISS-24-1-6001)

Corresponding Author

Zhou,Yu.

Funding

Sichuan Province Social Science Key Research Base "Aging Cause and Industrial Development Research Center", Project of the Year 2023: "Evaluation of the Suitability of Neighbourhood Public Space from the Perspective of Active Aging" (project number: XJLL2023001).

life of residents. The ageing of residents' communities is manifested in the problems of old community facilities and single community functions, leading to a decline in community cohesion and hindered social integration. These characteristics of an aging city are intertwined, forming a systemic problem that urgently requires a comprehensive and in-depth solution.

(2) Urgency of landscape renewal

As the problem of aging cities becomes more and more prominent, landscape renewal has become an urgent and unavoidable task. Landscape renewal can enhance the city's image and inject new vigour and vitality into the city. By renewing the city's buildings, roads, squares and other public spaces to make them more modern and aesthetically pleasing, it can attract more people and resources to invest in them and promote the overall development of the city. Landscape regeneration is crucial to improving the quality of life of residents. Renewed urban spaces can provide more leisure and recreational facilities, optimise traffic flow, and make it easier for residents to enjoy the city's various resources and services. Most importantly, landscape regeneration is an effective means of solving environmental problems in ageing cities, and through the introduction of green and sustainable design concepts, urban ecology can be restored and upgraded.

3. Theoretical Basis of Urban Green Space System Planning

(1) Overview of green space system planning

As an important part of urban planning, green space system planning aims to rationally allocate green space resources in the city through scientific methods and strategies, so as to achieve the optimisation and sustainable development of the urban environment. The overview of green space system planning includes the overall knowledge of urban green space, which not only focuses on the balance of quantity and distribution, but also emphasises the multi-functionality of green space. Green space system planning regards urban green space as an organic system, covering parks, squares, greenways and other forms, in order to promote the ecological balance of the city, improve the quality of the environment and enhance the quality of life of residents. The continuity and interconnectedness of the urban ecosystem is emphasised in the concept of green space system planning. By unifying green space elements, planners can create a more integrated cityscape while promoting mutually supportive and complementary urban ecosystems. In addition, green space system planning also focuses on synergies with other urban planning areas to ensure that green spaces are systematically and rationally integrated into the overall urban plan to form an organic urban structure.

(2) Planning principles and methods

When formulating green space system planning, a series of planning principles and methods must be followed to ensure that the planning is scientific and practical. The natural geographic characteristics of the city should be fully considered, and the location and scale of the green space should be reasonably determined through scientific surveys and analyses. Land use, water resources, climate and other factors need to be considered comprehensively in the planning to ensure the feasibility and sustainability of the planning. Green space system planning needs to be close to community needs and residents' interests. Through extensive community participation, it is important to understand residents' expectations and needs for green space, so that planning can be closer to reality and better meet residents' living and leisure needs. At the same time, the cultural and historical background of the community needs to be taken into account in the planning, so that the green space can be integrated into the community and its social identity enhanced. In terms of planning methodology, the use of advanced technical means such as Geographic Information System (GIS) and remote sensing technology can more accurately obtain urban spatial information and provide scientific data support for planning. In addition,

the introduction of methods from disciplines such as systems engineering and ecology helps to consider the role of green space in the urban ecosystem in a comprehensive manner and promote sustainable urban development.

4. The Role of Urban Green Space System Planning in Landscape Renewal

(1) Spatial remodelling and urban green space system

The primary role of urban green space system planning in landscape regeneration is to create a more attractive and vibrant environment for the city through spatial remodelling. This planning strategy injects new vitality into an aging city by deeply re-engineering its spatial structure, bringing a unique landscape look to the city. Firstly, by introducing a green space system, the planners succeeded in improving the layout of the city and breaking down the original monolithic urban structure. This change not only improves the overall image of the city, but also creates a more livable living space for the residents and injects a new impetus for urban renewal. In the process of spatial remodelling, green space system planning plays a key role in the urban layout. By re-planning the spatial structure of the aging city, planners have successfully increased the continuity of urban green space, forming a multi-layered and diversified urban landscape. This multi-layered landscape design not only gives the city a more three-dimensional appearance, but also creates a more diverse living experience for the city's residents. This continuity and diversity of landscape design makes the city no longer a single, dull structure, but a vibrant and changing ecosystem, laying a solid foundation for the sustainable development of the city. This spatial remodelling is not only reflected in the enhancement of the overall image of the city, but also brings about a profound change in the functional layout and spatial utilisation of the city. Through the introduction of the green space system, the planners have successfully created a multi-functional urban space, integrating different forms of green space elements such as parks, squares and greenways. This organic integration has led to a more spatially compact and efficient urban green space, resulting in a closer connection between the various areas of the city. Residents can find more diversified leisure and recreational choices in this multi-functional green space, enriching their daily lives. This change not only changes the outward appearance of the city, but also brings a more convenient and pleasant living environment, making the city an ideal place for people to dream of.

(2) Community participation in sustainable development

Another important role of urban green space system planning in landscape renewal is to achieve sustainable development through community participation. Community participation is not just about having a voice in decision-making, but also about integrating the green space system into the life of the community and making it part of the community. Through extensive community participation, planners can better understand the needs and aspirations of residents and provide more practical solutions for the design and renewal of green space systems. Community participation also helps to enhance residents' sense of ownership and responsibility for the green space, making them more proactive in the maintenance and management of the green space. This sustainable development model of community participation helps to form a green space system that is managed by residents and the community, thereby achieving sustainable development. This not only helps to solve the environmental problems faced by ageing cities, but also provides a healthier and more livable living environment for urban residents.

5. Impact and Effectiveness of Urban Green Space System Planning

(1) Air quality improvement

One of the significant impacts of urban green space system planning in landscape regeneration is its positive improvement of air quality. Through various measures, such as increasing the coverage of green space and

introducing more vegetation, this planning strategy effectively purifies the urban air environment and creates a fresher and more pleasant living atmosphere for residents.

By increasing the coverage of urban green space, planners have effectively expanded the area of urban green space to occupy a larger proportion of urban space. The introduction of this green space is not only to beautify the urban landscape, but also to form an ecosystem in the city to slow down the accumulation of harmful substances in the environment. Green spaces effectively reduce the concentration of harmful substances in the air through the absorption of plants, which in turn reduces the level of air pollution. Vegetation acts as a natural filter in the process, providing fresher air for city dwellers and helping to improve their quality of life. The introduction of more vegetation, such as trees and lawns, adds a rich green element to the city. These greens are not only ornamental but also natural air purifiers. Vegetation releases oxygen through photosynthesis, which increases the oxygen content of the urban air, thus enhancing the breathing environment for residents. At the same time, the vegetation can also effectively absorb particles and harmful gases from exhaust fumes and convert them into harmless substances, thus reducing traffic-induced air pollution. This process of designing and introducing green space system planning essentially acts as a green lung for the city, providing a fresher and more pleasant climate. Urban green space system planning is not only limited to a single means of air purification, but also supports the improvement of air quality by reducing the heat island effect in the city. Through rational urban layout and vegetation configuration, planners have succeeded in lowering the surface temperature of the city and slowing down heat build-up in the city. This reduction in the heat island effect results in cooler air, less frequent use of energy-consuming equipment such as air conditioners, and a reduced reliance on energy. Thus, this planning strategy not only improves air quality, but also provides a useful boost to the city's ecological balance and resource efficiency.

(2) Socio-economic benefits

One of the significant impacts of urban green space system planning in landscape regeneration is its positive improvement in air quality. Through various measures, such as increasing the coverage of green space and introducing more vegetation, this planning strategy has effectively cleaned up the urban air environment and created a fresher and more pleasant living atmosphere for the residents.

By increasing the coverage of urban green space, planners have effectively expanded the area of urban green space to occupy a larger proportion of urban space. The introduction of this green space is not only to beautify the urban landscape, but also to form an ecosystem in the city to slow down the accumulation of harmful substances in the environment. Green spaces effectively reduce the concentration of harmful substances in the air through the absorption of plants, which in turn reduces the level of air pollution. Vegetation acts as a natural filter in the process, providing fresher air for city dwellers and helping to improve their quality of life. The introduction of more vegetation, such as trees and lawns, adds a rich green element to the city. These greens are not only ornamental but also natural air purifiers. Vegetation releases oxygen through photosynthesis, which increases the oxygen content of the urban air, thus enhancing the breathing environment for residents. At the same time, the vegetation can also effectively absorb particles and harmful gases from exhaust fumes and convert them into harmless substances, thus reducing traffic-induced air pollution. This process of designing and introducing green space system planning essentially acts as a green lung for the city, providing a fresher and more pleasant climate. Urban green space system planning is not only limited to a single means of air purification, but also supports the improvement of air quality by reducing the heat island effect in the city. Through rational urban layout and vegetation configuration, planners have succeeded in lowering the surface temperature of the city and slowing down heat build-up in the city. This reduction in the heat island effect results in cooler air, less frequent use of energy-consuming equipment such as air conditioners, and a reduced reliance on energy. Thus, this planning strategy not only improves air quality, but also provides a useful boost to the city's ecological balance and

resource efficiency.

6. Conclusion

Urban green space system planning in landscape regeneration is not only a theoretical framework, but also an effective tool to achieve sustainable urban development. By improving the spatial structure, stimulating community vitality and enhancing the quality of ecological environment, urban green space system planning has injected new impetus and vitality into the renewal of aging cities. In future urban planning and development, the role of urban green space system planning should be paid more attention to and given full play to, so as to realise the virtuous circle of urban renewal and sustainable development.

References

- [1] Ding Jingyi. 2018. Urban aging and green space system planning countermeasures. *Journal of Urban Planning*, 22(3), 45-56.
- [2] Zhang Zhanpeng, Li Yuke. 2019. Research on urban spatial remodeling from the perspective of landscape renewal. *Journal of Architecture*, 34(7), 112-124.
- [3] Zhang Shujing, An Meng. The role and practice of community participation in the renewal of aging urban landscape in 2020. *Urban Design*, 15(2), 78-89.
- [4] Luo Tao. Study on the impact of urban green space system planning on air quality improvement in 2017. *Environmental Science Research*, 30(5), 789-797.