Urban green space management in ancient Chinese capitals
Case studies of Chang'an, Lin'an and Beijing

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Abstract

Urban green spaces are crucial for the sustainable development of cities, not only in terms of planning and construction, but also in terms of management frameworks. This exists not only in modern cities, but also in ancient cities, especially in ancient Chinese capitals with high density. However, existing research on green spaces in ancient Chinese cities focuses predominantly on their spatial distribution and morphology as results of planning and construction, while neglecting the underlying and ongoing process of management. This research adopts an integrative case study methodology, selecting three representative high- density ancient Chinese capitals: Chang'an in the Tang Dynasty (618-907), Lin'an in the Southern Song Dynasty (1127-1279), and Beijing in the Qing Dynasty (1644-1911). It systematically examines their green space management, including developmental contexts, institutional frameworks, focal objects, leading forces, and management effectiveness. Through comprehensive analysis and comparison, it is revealed that while ancient Chinese capitals consistently prioritised and institutionalised urban green space management, their distinct historical contexts shaped specific focuses within management practices. Moreover, the nature of administrative agencies and the degree of public participation significantly influenced the long-term efficacy of urban green space management.

Keywords
urban green space management, ancient Chinese capitals, high density, ecological protection

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INTRODUCTION

Over the preceding four decades, China has undergone a high-speed process of urbanisation,[1] generating numerous cities and metropolitan regions with high density.[2] While the agglomeration of population and industries in urban areas has contributing positively to regional economic dynamism, social advancement and culture vitality, it has simultaneously engendered a multitude of environmental concerns, exerting considerable pressure on regional ecological systems.[3] Hence, the significance of environmental sustainability has been emphasised in high-density urban regions. Constituting a crucial facet of urban sustainable development,[4] urban green spaces embody all natural, semi-natural and artificial ecological systems with and around a city capable of providing ecosystem services,[5] which encompass not only the regulating functions of ecosystems such as air purification, climate conditioning, stormwater regulation and biodiversity preservation but also derived human benefits spanning recreation, aesthetics and social interaction.[6]

High-density cities are not an occurrence exclusive to modern society. In ancient China, despite the enduringly limited level of urbanisation, a succession of large-scale and densely populated cities emerged, propelled by the combined forces of politics, military and commerce. A significant proportion of these cities served as imperial capitals, often with the population exceeding one million.[7] Similar to contemporary high-density metropolises, these ancient capitals were confronted with ecological repercussions resulting from intense human activities, compelling them to implement rigorous measures for the preservation and management of urban green spaces. While urban green space management of ancient Chinese capitals has obtained attention in the fields of environmental history[8] and urban history,[9] research in planning history remains predominantly focused on the spatial distribution and morphology of urban green spaces, with a tendency to neglect their underlying and ongoing management. The existing literature presents two primary shortcomings. Firstly, it tends to analyse the morphology and management measures of green spaces in isolation, failing to contextualise these spaces within broader urban frameworks to explore their intricate interdependencies. Secondly, it is inclined to fragmentedly examine green space management within specific cities and periods, overlooking the continuity of urban green management practices across ancient Chinese.

In such a context, this research adopts an integrative case study methodology, selecting three representative examples of high-density ancient Chinese capitals: Chang'an in the Tang Dynasty (618-907), Lin'an in the Southern Song Dynasty (1127-1279), and Beijing in the Qing Dynasty (1644-1911), which stood as the most populous cities during the 7th, 13th, and 18th centuries respectively.[10] With the divergence of historical eras and geographical locations, these cities encountered analogous challenges concerning urban green space preservation and implemented effective management measures. Under this precise, the green space management of each capital is delineated in a systematic manner, spanning their developmental background, institutional frameworks, focal objects, lead forces, and management efficacy. Subsequently, comprehensive evaluation and comparison are conducted to identify systemic parallels and principles. The study reveals that while ancient Chinese capitals demonstrated

a continuous prioritisation and institutional framework for urban green space management, urban spatial-demographic structures formed in divergent historical contexts had led to nuanced focuses in the objects of management. Additionally, the nature of administration and the degree of public participation also had significant impacts on the effectiveness of urban green space management in the long term.

URBAN GREEN SPACE MANAGEMENT IN CHANG'AN

In 618, the Tang Dynasty was founded under the leadership of Li Yuan (Emperor Gaozu of Tang). The former capital of the Sui Dynasty, Daxing, which was constructed at the end of the 5th century, was renamed Chang'an, continuing as the capital. At that time, Chang'an was one of the most expansive cities globally, comprised of the Palace City, the Imperial City, and the Outer City, with an expanse of 84 square kilometres.[11] The population of Chang'an was considerable, earning it the description of "no less than a million" in the poetry and prose of the Tang Dynasty.[12] Contemporary studies assert that the population of Chang'an during the Tang era at least ranged from 500,000 to 600,000, and possibly as high as 1.7 to 1.8 million.[13]

The intensified economic and social activities within Chang'an posed a significant threat to the regional ecosystem, particularly the forest vegetation. Since the construction materials of ancient Chinese buildings were predominantly wood, substantial timber resources were necessitated for the construction of large-scale palaces, governmental edifices, temples, and residential buildings within Chang'an.[14] Moreover, the daily activities of the city's vast population relied heavily on charcoal, which further exacerbated the strain on forest resources. Statistical data indicates that 200-400 square kilometres of forestland could barely satisfy the charcoal requirements of Chang'an for a single year.[15]

In the early stages of ancient Chinese, there had already been a recognition of the ecological functions of trees, as evidenced by ancient classical texts like *Guanzi* and *the Book of Han*. *Guanzi* recorded that "planting thorns, used to solidify the soil; intermingled with cypresses and poplars, used to prevent the collapse of dykes."[16] And in *the Book of Han* it is written that "destroying hundreds of zhang[17] of the land, pinning the essence of the yin-chi[18], the ground would be empty, not capable of containing the gas and forming the clouds. Chopping down trees is not forbidden all year around, and droughts and floods may result from this."[19] These arguments in the Qin and Han dynasties demonstrated an awareness of the importance of forests in soil and water conservation, flood mitigation, and climate regulation. Given the imperative of preserving forest resources, the government of Chang'an in the Tang Dynasty placed a high priority on tree planting and conservation endeavour within the city, and thereby street greening emerged as a pivotal aspect of urban green space management in Chang'an.

In the Tang Dynasty, the administrative structure known as the "Three Departments and Six Ministries" included the Ministry of Gong [the Ministry of Engineering], under which the Ministry of Yu responsible for the management of natural resources. The Ministry of

Yu's remit embodied "to be in charge of the planting of the streets and lanes of the capital city, the mountains and rivers, the grass, trees, charcoal, and the supply for hunts."[20] These responsibilities presented the extensive and meticulous approach to green space management during the Tang Dynasty, spanning a broad spectrum of vegetation and water resources. The prominent placement of urban street planting in Chang'an at the forefront of these duties underscored the critical importance of street greening. In addition to the Ministry of Yu established by the central government, it was the city's chief official, Jinzhao Yin [the Minister of Capital], and his subordinates who were actually engaged in the daily management of street greenery.

The distribution of street greenery in Chang'an was very extensive. Implementing the "li-fang" system, Chang'an had eleven major roads in the north-south direction, and fourteen in the east-west direction, dividing the city into 109 fang [residential neighbourhoods] and two shi [market districts]. There were walls at the boundary of the fang, and the roads outside the fang were adressed "streets", while the roads inside were called "alleys". According to *Tang Hui Yao [Institutional Compilation of Tang]*, "on the 14th day of the first month of the second year of Yongtai (766), Ligan, the Jingzhao Yin, said that all the streets in the capital should be planted." It showed that the twenty-five streets in Chang'an were planted with street trees (Figure 1). There was also a strict requirement for the species of street trees, primarily acacia. In 788, "due to a shortage of official street trees, elm trees were planted as substitutes. Wu Cou, the Jingzhao Yin, insisted that 'elm is not suitable to the official streets', urgently ordered to change with acacia trees."[21]

The management of street greenery in Chang'an was predominately controlled by the city government, who oversaw the planting of street trees as well as allocated the necessary funds. *Tang Hui Yao* recorded that, "in the ninth month of the first year of Guangde (763), it was decreed that neither officials nor citizens were allowed to plant trees on the streets at will."[22] "By the ninth month of the ninth year of Taihe (835), additional trees were planted along the streets. The left and right street officials were appointed to oversee the planting, funded by the Prefecture of Jinzhao."[23] Strict regulations were also enacted to protect the street greenery, prohibiting private felling and punishing even minor damage. *Quan Tang Wen [Complete Prose of Tang]* recounted an incident in which an individual was impeached by the Jinwu [Patrolman of Chang'an] for cutting the galls from a street tree, with the intention of making tribute pillows.[24]

The street greenery management of Chang'an attained positive outcomes, not only fulfilling ecological functions but also cultivating a distinctive urban culture. The extensive planting of acacia trees on both sides of the streets led to "acacia" becoming a prominent image in Tang poetry and the "green acacia street" evolving into the epithet of Chang'an's street. The famous poet Bai Juyi vividly described the urban landscape, writing, "A long way across the green acacia street, eight or nine fangs away between us,"[25] which illustrating the pivotal role of street greenery in the city's cultural identity. Nevertheless, the continuity of street greening management in Chang'an fluctuated over time, as evidenced by repeated governmental directives to plant street trees, which suggested instances of deforestation or neglect.[26]

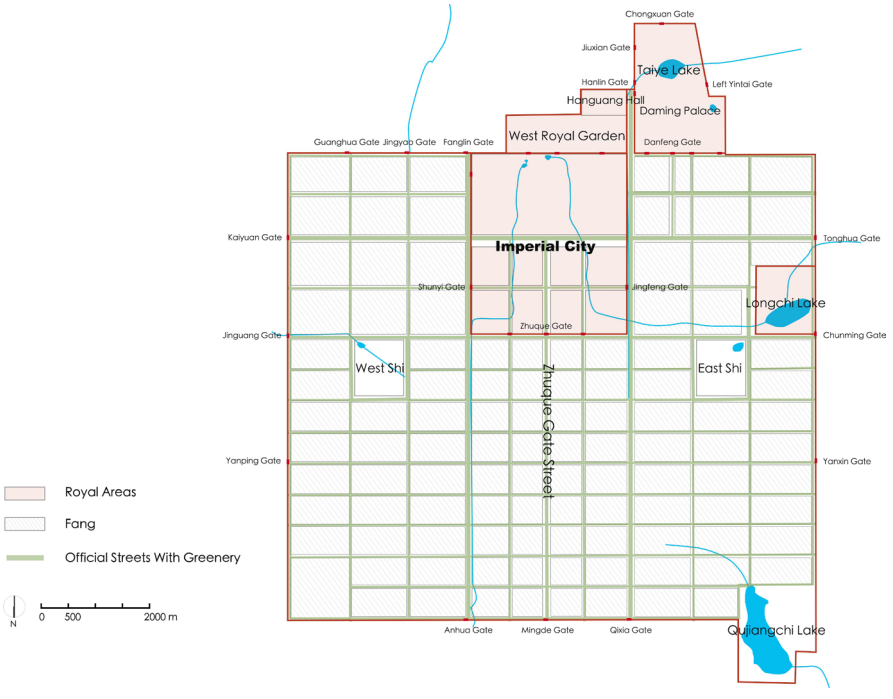

Fig. 1. Distribution of Street Greenery in Chang'an. All the twenty-five main streets in Chang'an were planted with street trees in the Tang Dynasty

URBAN GREEN SPACE MANAGEMENT IN LIN'AN

In 1127, Dongjing, the capital of the Northern Song Dynasty, was seized by the Jin army, culminating in the capture of Emperor Huizong and Qinzong. Subsequently, Zhao Gou (Emperor Gaozong of the Song Dynasty) ascended the throne in Yingtian, marking the inception of the Southern Song Dynasty. Due to successive military setbacks, the Southern Song Dynasty was compelled to relocate its capital on several occasions during its formative years. It was not until the eighth year of Shaoxing (1138) that Emperor Gaozong formally decreed Lin'an as the capital. Compared to other ancient Chinese capitals, Lin'an in the Southern Song Dynasty was a modestly sized city of about 15 square kilometres, but attributed to the influx of immigrants from the north and the unprecedented rise in the city's political and economic influence, Lin'an's population swelled rapidly, with the urban area overflowing beyond the city walls. It is estimated that the population of Lin'an in the Southern Song Dynasty ranged from 800,000 to 900,000 within the city and over 400,000 outside the walls, indicative of its remarkable population density.[27]

Lin'an in the Southern Song Dynasty basically continued the urban structure of Hangzhou in the Northern Song Dynasty. Prior to its designation as the capital, the city still had a surplus of space. However, during the Southern Song era, the population surge led to a boom in the demand for housing, resulting in an increasingly scarcity of urban land. In order to satisfy the

demand for land, urban residents encroached upon public spaces such as streets, green land, and water areas, which combined with crowded living conditions and the random dumping of household waste posed a pervasive threat of pollution and shrinkage to Lin'an's water bodies.[28] There were initially four rivers and canals in Lin'an: the Maoshan River, the Yanqiao Canal, the Shihe River, and the Qinghu River, and by the end of the Southern Song Dynasty, three of them had silted up resulting from encroachment by residents.[29] Additionally, lakes in the city were also confronted with the occupation by the rich.[30]

During the Song Dynasty, there was a relatively systematic understanding of the ecological and economic functions of urban water bodies such as reservoirs and ponds. The renowned litterateur in the Northern Song, Su Shi, while serving as the governor of Hangzhou, composed the prose *Hangzhou Qi Dudie Kai Xihu Zhuang [Request to Dredge the West Lake in Hangzhou]*. In this work, he identified the five essential functions of the West Lake: providing habitats for fish and birds, supplying urban water, supporting agricultural irrigation, feeding canal systems, and supplying materials for brewing, underscoring the necessity of dredging to prevent the lake from silting up and transforming into land.[31] For Lin'an in the Southern Song Dynasty, the West Lake with "the circumference of 30 *li*"[32] was undoubtedly the most significant urban green space (Figure 2). In the context of the widespread threat to ponds and canals, the protection and management of the West Lake became the paramount concern in the management of Lin'an's urban green spaces.

The Song Dynasty inherited the "Three Departments and Six Ministries" system in the central government, establishing the Ministry of Gong, which included the Ministry of Yu and the Ministry of Water to manage green spaces such as mountains, lakes, gardens, rivers, canals, and ponds.[33] Nevertheless, the management of the West Lake was not directly overseen by the Ministry of Yu and the Ministry of Water. Throughout the 150-year history of the Southern Song Dynasty, there were seven large-scale rehabilitation projects for the West Lake, all presided over by the city's chief official, the Lin'an Zhifu [the governor of the Prefecture of Lin'an], with his subordinate officer, the governor of Qiantang County. A professional organization composed of two hundred soldiers was formed under the command of the governor of Qiantang County. In the eighteenth year of Shaoxing (1148), a military officer was appointed for daily supervision, while the organisation was equipped with boats and buildings for the exclusive use of dredging the West Lake.[34]

Lin'an's management of the West Lake took the prevention of lake siltation and the treatment of water pollution as its main goals, and implemented three measures. Firstly, the dredging of connected water bodies was undertaken. Since the West Lake was linked to the inner city through the six wells excavated during the Tang Dynasty and a series of canals, the rehabilitation endeavours ought to begin with dredging these wells and canals. Secondly, the occupation of the lake for cultivating was prohibited. Residents along the lake had occupied parts of the lake to cultivate aquatic crops such as wild rice, water chestnut, and lotus root, which contributed to the siltation of the lake. Additionally, the use of manure fertilizers for these crops caused severe water pollution. Thirdly, the strict control on sewage discharge was conducted. *Meng Liang Lu [Mengliang Records]* ever recorded that an official "occupied the ponder, building houses and washing dirty horses," resulting in the pollution of the West Lake, and ultimately was "demoted and dismissed", the house was also demolished.[35]

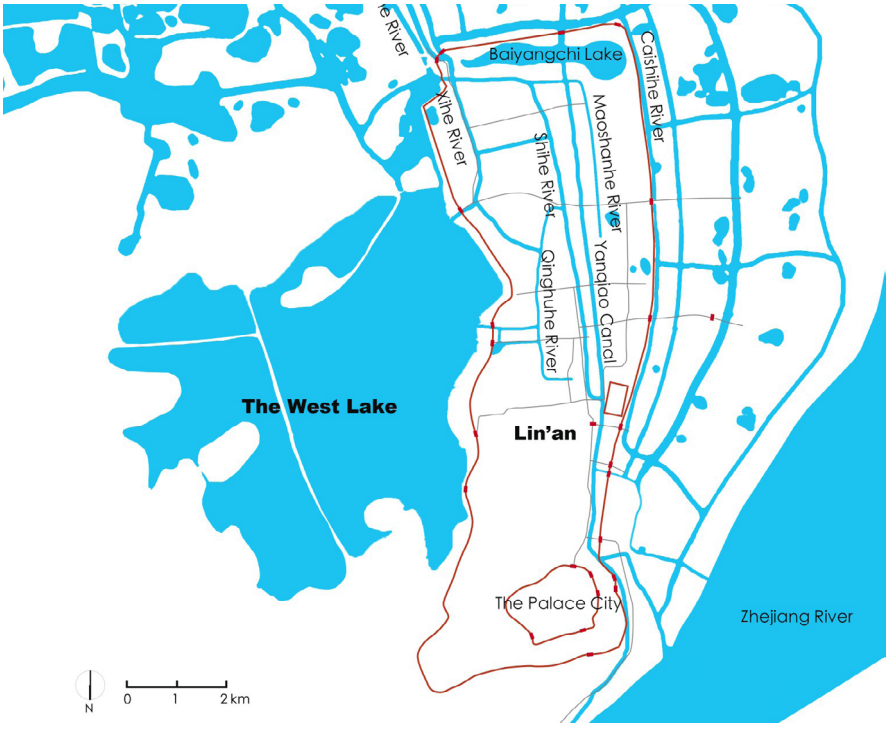

Fig. 2. Water System in Lin'an Region. The West Lake, connected to the city through rivers and canals, is one of the most important water bodies surrounding Lin'an.

While the management of the West Lake in Lin'an was reliant on the government similarly, authorities increasingly emphasised the mobilisation of the common people given the extensive labour requirement. For example, in the fourth year of the Qiandao (1168), Zhou Cong, the *Lin'an Zhifu*, oversaw the dredging of the canal linked to the West Lake, allocating 300,000 wen[36] of currency and 16,000 hu[37] of rice in order to recruit the "wandering people" to participate in the project.[38] In the process of managing the West Lake, the government and the people realised an active interaction. Those administrators who made contributions to the rehabilitation of the West Lake and served the public interests were often rewarded with accolades and commemorations from the populace. For example, in order to commemorate the achievements of the governor Zhao Yuchou in the management of the West Lake, the people of Lin'an addressed the dyke he built the "Zhao Gong Dyke".[39]

After a successive of rehabilitation projects, the West Lake of Lin'an in the Southern Song Dynasty sustained a favourable ecological environment, evolving into a premier destination for public leisure and recreation, and greatly facilitated the flourishing of the West Lake culture epitomised by the renowned "Ten Scenes of West Lake" (Figure 3). Nevertheless, despite the existence of specialized agencies and official regulations, these institutions and laws were subject to subsequent neglect. The absence of a sustainable long-term mechanism necessitated periodic large-scale interventions every 10-30 years to preserve the lake's ecological functions.[40]

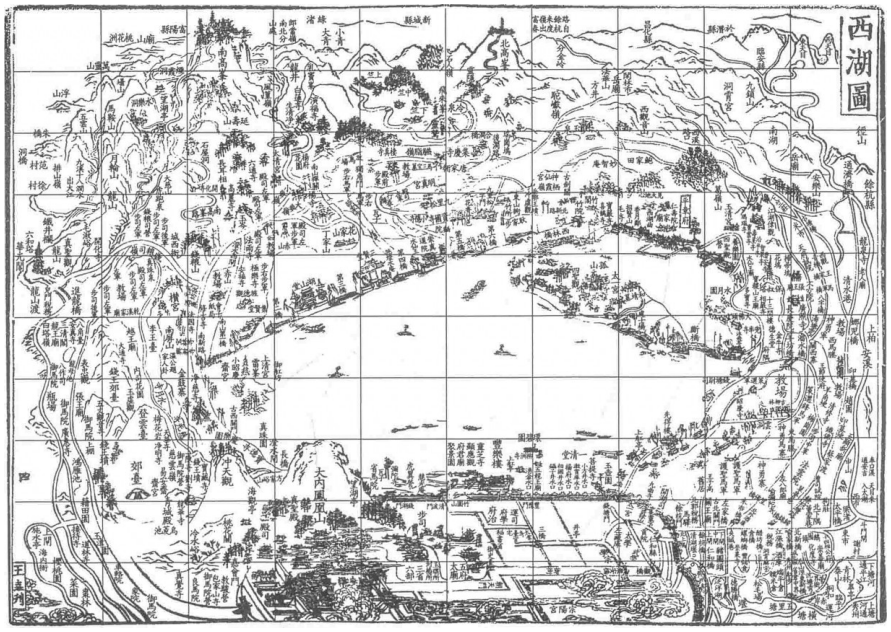

Fig. 3. Xihu Tu [Picture of West Lake] in Xianchun Lin'an Zhi [Lin'an Gazetteer in Xianchun Era]. This picture painted in the Southern Song Dynasty depicts the close spatial and functional relationship between the city of Lin'an and the West Lake, which featured expansive waters and numerous cultural landscapes.

URBAN GREEN SPACE MANAGEMENT IN BEIJING

In 1648, the Qing army captured Beijing, culminating in the establishment of the final dynasty of the Chinese Empire by the Manchus, who inherited Beijing as its capital. The urban configuration of Beijing in the Qing Dynasty entirely followed that of the Ming Dynasty, consisting of two principal sections: the Inner City and the Outer City. The Inner City, situated to the north, encompassed an area of 35.6 square kilometres, whereas the Outer City, located to the south, covered 25.5 square kilometres. Enclosed within the Inner City was the Imperial City, at the heart of which lay the Forbidden City. The tumultuous wars at the end of the Ming Dynasty had resulted in a reduction in Beijing's population. However, with the advent of the Qing Dynasty, the population began to rise steadily. By the forty-sixth year of Qianlong (1781), the population of the Inner City had increased to 541,000, while that of the Outer City had reached 235,000.[41]

While the spatial configuration of Beijing witnessed no significant alteration, the segregation of the Manchus and the Han Chinese was introduced in the Qing Dynasty, denoting that the Manchu officials were confined to the Inner City, while the Han Chinese were compelled to move to the Outer City.[42] Consequently, the Inner City, predominantly occupied by the Manchus, had a limited productive population but a substantial consumer base.[43] The in-

habitants, distinguished by their relatively high social status and cultural literacy, exhibited a pronounced demand for leisure and recreational activities.[44] Urban green spaces are the principal venues for providing the functions of leisure and recreation in the city. In Beijing, especially within the Inner city, although many green spaces existed, the majority were within the restricted precincts of the Imperial City and therefore inaccessible to the general public. The Shichahai Lake, located to the north-west of the imperial city, as the sole extensive water area accessible to the residents of the inner city, naturally evolving into a significant space for leisure and recreation (Figure 4).

During the Qing Dynasty, specialised agencies were established in the central government to manage green spaces, including the Yuheng Qingli Si [the Agency of Natural Resources] and the Dushui Qingli Si [the Agency of Water], both under the Ministry of Gong. The Shichahai Lake, however, designated as a royal garden, was thereby administered by the Fengchen Yuan under the Ministry of Court responsible for the management of the royal gardens and rivers.[45] The Fengchen Yuan appointed two deputy officials to oversee the Shichahai Lake, whose duties included the supervision of the river banks, planting trees, and cultivating lotus flowers.[46]

During the Qing Dynasty, since the Shichahai Lake was regarded as part of the royal garden, it was subject to rigorous oversight by the Fengchen Yuan. Despite the absence of formal ramparts enabling access for the public, individuals were prohibited from utilizing its waters without explicit permission from the emperor.[47] Furthermore, residences adjacent to the Shichahai Lake were forbidden from having front doors facing the lake, restricted to admiring the scenery merely from the rear entrance.[48] The Fengchen Yuan enforced strict regulations, reserving the waters of the Shichahai Lake solely for royal use and leased its shoreline for the cultivation of lotus and rice to acquire revenues.[49] Nevertheless, the Shichahai Lake remained a favoured gathering spot for merchants and literati from the Inner City, particularly in June. When lotus blooms drew crowds of tourists, teahouses and bazaars flourished around the lake, enhancing recreational options. However, the Fengchen Yuan consistently opposed recreational activities at the Shichahai Lake. In 1874, during Emperor Tongzhi's funeral rites, the sale of tea along the lake's shores was prohibited, resulting in a subdued atmosphere (Figure 5). Despite initiatives by officials and citizens in the late Qing Dynasty to transform the lake into a city park, these efforts were thwarted by vehement opposition from the Fengchen Yuan, preventing their realization.[50]

The rigorous management of the Shichahai Lake in Beijing during the Qing Dynasty, while effectively curbing disorderly encroachment by urban residents and preserving the ecological balance, regrettably overlooked the recreational and leisure functions of this urban green space, depriving the populace of economic and social benefits derived from the protection of the lake. Consequently, around the collapse of the Qing Dynasty, the ecological environment of the Shichahai Lake suffered severe degradation due to the sudden relaxation of governmental oversight, partly attributed to the approach to urban green space management.

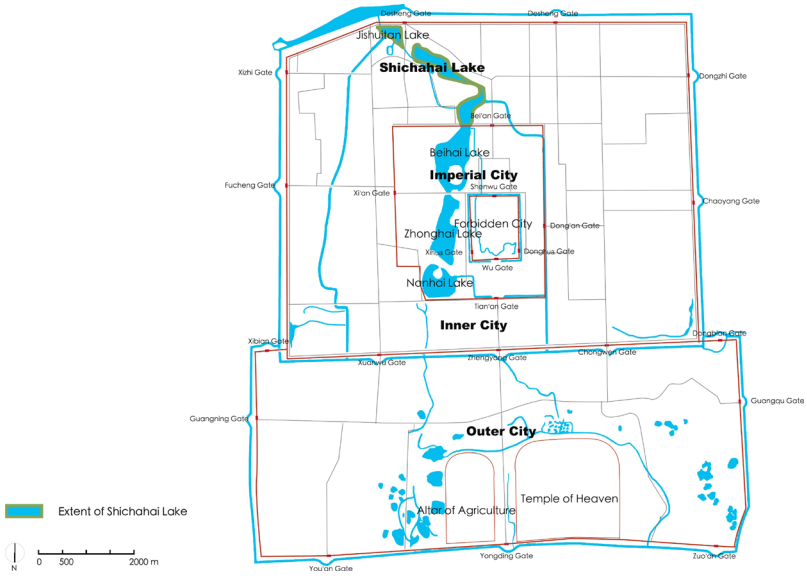

Fig. 4. Location of Shichahai Lake. The Shichahai Lake comprised of three connected parts is situated in the north-west of the Inner City, serving as the widest water area outside the Imperial City.

Fig. 5. Photographs of Shichahai Lake in Late Qing Dynasty. From top to bottom, from left to right, these photos respectively display the lake surface in winter and summer, tea tents on the lakeshore and a well adjacent to the lake

CONCLUSION

Through delineation of three ancient Chinese high-density capitals, Chang'an in the Tang Dynasty, Lin'an in the Southern Song Dynasty and Beijing in the Qing Dynasty, the continuity in the urban green space management of ancient Chinese capital cities is revealed. In terms of the historical contexts, all three cities gathered a large population in a certain period, imposing burdens on the environment and social development, and thereby great importance placed to the management of key urban green spaces. While the Ministry of Yu, operating under the Ministry of Gong, served as a specialised agency for green space management, its limited capacity often necessitated direct oversight by city governors or the royal court. Management practices were characterized by strict regulations, with individual encroachments and polluting behaviours facing severe penalties.

Nevertheless, notable distinctions existed in the management of urban green spaces across the tree cities. Firstly, despite their shared characteristic of high density, the three capitals were featured with divergent demographic- spatial structures, resulting in varied requirements and challenges pertaining to green space management. For instance, in the influence of the disruptive wars, Lin'an's urban planning significantly lagged behind its rapid urban expansion, causing severe urban congestion, and thus the management of green spaces such as lakes and canals, which were susceptible to encroachments by the inhabitants, became a pressing concern. Beijing stood out uniquely due to the segregation of the Manchus and the Han Chinese, which generated a sizable leisure class in the inner city, engendering a heightened demand for recreational amenities provided by urban green spaces. Secondly, the nature of the management agencies and the degree of popular participation affected the effectiveness of management. In Chang'an and Lin'an, the management of urban green space was implemented by the chief governor of the cities, who relatively emphasised the coordination of diverse functions including ecological regulation, political symbolism, and public recreation, providing the populace with more benefits, which facilitated the integration of urban green space management into the urban culture. However, this comprehensive institutional approach often relied on intermittent corrective measures and was susceptible to entering a cycle of "management- neglect-management." On the contrary, urban green space management in Beijing was predominantly conducted by palace institutions, accountable solely to the imperial family, thereby exhibiting an excess of strictness in management but a deficiency in openness. Although green spaces received rigorous preservation under the strong royal authority, the populace derived limited benefits from it, thus failing to cultivate a positive culture of conservation. Once political power weakened, it could lead to extremely adverse consequences.

Contemporary management of urban green spaces can derive insights from the experiences of ancient Chinese capital cities. Primarily, the varied contexts of modern cities pose distinct challenges and requirements for green space management, thus it is imperative for management strategies to holistically consider the demographic-spatial structure of the urban area, in order to cope with diverse ecological threats stemming from human activities and meeting the multifaceted needs of the public. Secondly, urban green space management must em-

brace a more comprehensive and participatory framework, integrating multiple functions and stakeholders to foster public participation and cultivate the urban culture of ecological preservation, which are crucial for facilitating the long- term and sustainable conservation of urban green spaces.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

NOTES ON CONTRIBUTOR(S)

Haoran Zhang, Master Degree Candidate in Urban and Rural Planning at Tsinghua University, contributed to this paper. His research focuses on the history of urban and regional planning in ancient China.

ENDNOTES

1. Liao, Wu, Wong, and Shen, "Provincial Perspective Analysis," 138964.
2. Ouyang, Tang, Wei, and Li, "Spatial Interaction," 105587.
3. Chen, Wang, and Zeng, "Impact," 106964.
4. Wang, Zhang, Zhang, Song, and Ye, " Spatio-Temporal Trends," 106598.
5. Haaland and van den Bosch, "Challenges," 760-71.
6. Aronson, Evans, Goddard, Lerman, MacIvor, Nilon, and Vargo, "Biodiversity," 189-96.
7. Skinner, *The City in Late Imperial China,* 29-31.
8. Shi, "Han Tang Chang'ancheng," 5-22; and Cui and Zhou, "Tang Chang'an," 166-171.
9. Zhang, *Chengshi Fazhan;* Liang, "Nan Song Chengshi," 254-316; and Lin, and Yin, "Nan Song," 698-704.
10. Zhang, Tang Du, 11 (cited in the foreword); Xu, Nan Song, 26 (cited in the foreword); and Skinner, *The City in Late Imperial China*, 31.
11. Seo, *Chang'an*, 45.
12. According to Han Yu's prose on the *Suspension of the Imperial Examinations this Year* (803), "The population of the capital city is now not less than one million, and the number of those who take part in the Imperial Examinations is but five or seven thousand, which, together with his servants, is not more than one per cent of the total population of the capital city." (Dong, *Quan Tang Wen*, 586-587.)
13. The mainstream view believes that the population of Chang'an in the Tang dynasty was one million, but there are some different views: Xianwen Zheng insists that the population of Chang'an in the Tang dynasty was 500,000-600,000, Gengwang Yan estimates that the population of Chang'an reached 1.7-1.8 million, and Tatsuhiko Seo believes that the population of Chang'an was 700,000 in the first half of the 8th century. For a specific discussion of the population of Chang'an see: Zhang, *Chengshi Fazhan*, 37.
14. Cui and Zhou, "Tang Chang'an," 166-171.
15. Gong, "Tang Chang'ancheng," 137-153.
16. Liu and Jiang, *Guanzi*, 376.
17. "Zhang" is a unit of length in ancient China, and one zhang equals ten-thirds of a metre.
18. "Yin-qi" is a Chinese philosophical concept, represents the nature of the land.
19. Ban and Yan. *Hanshu*, 3074.
20. Liu, *Jiu Tang Shu*, vol. 43, 1841.
21. Wang, *Tang Hui Yao*, 1576.
22. Wang, *Tang Hui Yao*, 1575.
23. Wang, *Tang Hui Yao*, 1575.
24. Dong, *Quan Tang Wen*, vol.984, 101832.

25. Bai and Xie. *Bai Junyi Shiji*, 586.
26. Zhang, *Chengshi Fazhan*, 132.
27. Regarding the population of Lin'an in the Southern Song Dynasty, there have been many different opinions and there is no definite conclusion yet. Wu Songdi's conclusion is adopted here, see: Wu, *Zhongguo Renkou Shi*, 574.
28. Liang, "Nan Song Chengshi," 254-316.
29. Qian, *Xianchun*, vol. 4, 1271.
30. Naide Weng, *Ducheng Jisheng*, 18.
31. Su and Li, *Su Shi Wenji*, vol. 30, 169.
32. Qian, *Xianchun*, vol. 4, 1175.
33. Gong, *Song Shi,* 181-182.
34. Lin, and Yin, "Nan Song," 698-704.
35. Wu, Zimu. *Meng Liang Lu*, 321.
36. "Wen" is a unit of money in ancient China.
37. "Hu" is a unit of volume in ancient China.
38. Zheng, Jin. *Hangzhou*, 76.
39. Zheng, Jin. *Hangzhou*, 80.
40. Zheng, Jin. *Hangzhou*, 83.
41. Han, *Beijing Lishi*, 110.
42. Social Science Federation of Xicheng District, Beijing, *Yuan Ming Qing Ji Minguo*, 115.
43. Wu, *Beijing Chengshi*, 109.
44. Yin, and Wu, *Beijing Chengshi*, 39.
45. Yin and Wei, *Beijing Chengshi*, 303.
46. It is recorded in *Da Qing Hui Dian Shi Li* (vol. 1171).
47. Zhao, *Shichahai*, 16.
48. Zhang, *Beijing Shichahai*, 4.
49. It is recorded in *Da Qing Hui Dian Shi Li* (vol. 1171).
50. Ha, "Guangxu," 56-57.

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