

PARK CITY LEADS THE WAY OF URBAN DEVELOPMENT AND INNOVATION IN CHINA

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Highlights

- ▶ The core concept of urban development changes from ecological city to sustainable city.
- ▶ Living environment focuses on green space, cultural ecosystem services and spiritual aesthetics.
- ▶ Spatial pattern, ecological function and living environment are the challenges of park city.
- ▶ Park city provides more possibilities for harmonious coexistence between human and nature.

Abstract. Cities have been the cradle of human civilization, with ongoing efforts to achieve the ideal city. Park cities prioritize “public” and “fair” principles in urban governance, emphasizing people-centered and livable spaces. This paper explores research hotspots and trends in park city evolution to support sustainable spatial planning. Analyzing 2278 articles covering country cooperation, research topics, and practices, the initial focus is on eco-city development, shifting towards ecological restoration and sustainable cities. Research focuses on urban gardens, ecological/cultural services, green spaces, and spiritual comfort. China’s park city construction faces challenges in spatial patterns, ecological functions, and human settlement, requiring attention in planning and management. More data, methods, and experiences are needed to inform science-policy planning in urban management, advancing sustainable pathways for people and nature.

Keywords: park city, urban ecosystem, CiteSpace, sustainable city, bibliometric analysis.

Introduction

City development has long been recognized as a planning strategy aimed at meeting the needs of people while simultaneously enhancing service capabilities and safeguarding the environment and biodiversity (Geneletti et al., 2020). The concept of the “garden city” was introduced into modern urban planning theory in Howard’s seminal book “Garden Cities of Tomorrow,” which proposed an ideal urban model that harmoniously blended rural landscapes with urban characteristics (Clark, 1967). Furthermore, the United Nations’ New Urban Agenda advocates for the significance of public green spaces and nature within cities to enhance ecosystem services and preserve biodiversity (United Nations General Assembly,

2018; UN-Habitat, 2020). In response to the imperative of planning and managing human settlements for environmental quality, the concept of the park city emerges as an integrated fusion of forested urban areas, city parks, green spaces, and recreational areas within residential communities (Yang & Yang, 2021).

Under the context of constructing ecological civilization, China has integrated parks into urban construction and development planning, exemplified by projects like the international garden city of Chengdu and the suburban garden city of Shanghai, representing the embryonic form of the park city concept (Liu et al., 2021). The Chinese government has embraced the principles of ecological civilization in the development of park city. Additionally, it is crucial to establish new growth poles and create

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open economy highlands, while considering its distinct characteristics and ecological values are also important (Yang & Zhang, 2020). The core value of the park city concept is advocating for “public” and “fair” and is committed to alleviating the problem of unbalanced and inadequate development in China. Consequently, it assumes a significant role in promoting regional sustainable development in the new era of socialist construction (Liu et al., 2021).

Park city differs from previous models of urban development such as garden cities, forest cities, and ecological cities, as they adopt a broader perspective on the relationship between urban development and nature (Smith et al., 2021; Yang et al., 2022). Firstly, park city encompasses not only traditional national parks, urban parks, and other natural conservation areas, but also refers more generally to the ecological environment and the concept of ecological civilization. Secondly, park city possesses distinctive park-like characteristics that integrate a beautiful environment, fresh air, clear water, the integration of park space with urban production and daily life, as well as a rich culture, convenient services, a safe environment, and an economically sustainable, green, low-carbon, and environmentally friendly industry. Thirdly, park city is founded upon the management concept, ecological philosophy, and ecological aesthetics of urban parks. They adhere to the fundamental laws and scientific principles of urban development, eschew anthropocentrism, and uphold the intrinsic value of various life form. As a result, establishing the concept and value of ecological aesthetics becomes vital in promoting the beauty of urban landscapes and governance through the idea of natural harmony in the park.

Excavating literature data and identifying research hotspots of park cities holds immense scientific significance and practical value in regulating urban ecological problems, promoting urban ecosystem management, and ultimately achieving regional sustainable development. This paper endeavors to analyze the research hotspots and development characteristics of park city in China, exploring the core themes of the research field, refining emerging hotspots, and summarizing the trajectory of development by using bibliometric methods to summarize countries, keywords, frontier hotspots, and topic evolution, we aim to find the co-development path of nature and the city and realize the ecological and sustainable management of urban areas.

1. Data sources and methods

Bibliometric analysis is employed in this study to comprehensively analyze the vast literature within the database and present the overall direction and focal points of the research topic in an intuitive way (Zupic & Cater, 2015). The CiteSpace software, a multi-dimensional, time-sharing, dynamic visualization analysis tool, is used for statistical analysis, exploring change trends and hotspots, and in-depth excavation in a specific scientific research field (Chen & Song, 2019; Chen, 2020; Zhao et al., 2021). In this study, country collaboration network analysis,

title co-citation and co-occurrence clustering analysis, and keyword burst detection analysis based on CiteSpace software (version 6.1.R6) are adopted to comprehensively review the research pertaining park city.

In this study, the Web of Science Core Collection database is utilized to investigate the current research status of park city and to prepare the data in the required format for analysis using CiteSpace software. The retrieval code is set as follows: (TS=park city and TS=eco*) and language: English and timespan: (1982.01.01-2022.12.31). The data search was conducted on December 31, 2022, and a total of 2409 results were collected and checked. After careful evaluation, 2278 valid results were selected as literature samples for analysis. Through publication statistics, the results reveal the distribution of research power of park city and explore the research hotspots and development trends in this field. The relevant research from 1982 to 2022 is visualized in knowledge maps and analyzed, providing scientific references for exploring the future path of park city in China.

2. Results

2.1. An overview

The figure presented in Figure 1 showcases the number of international literature publications on park city from 1982 to 2022, offering insights into the quantity of research output over time. Across all countries, there is a noticeable upward trend, indicating increasing interest and engagement in park city research. Notably, China, the United States, and Germany emerge as the top three countries with the highest number of published papers. Interestingly, The United States has been demonstrated an early emphasis on park city research, preceding the attention observed in China and Germany. Before 2018, the growth trend of literature in China appeared relatively stable, but there was a subsequent significant surge in the following years, reflecting a notable acceleration in research activity in this domain.

Country collaboration was analyzed and different levels of cooperation were established in the study (see Figure 2). Nodes in the collaboration network represent countries, and the link between nodes represents the

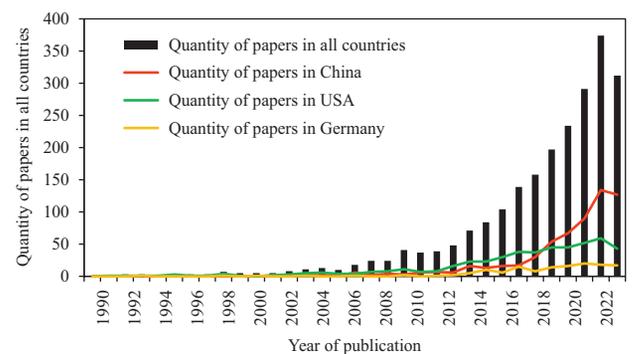


Figure 1. The trend of international publications related to park city from 1982 to 2022

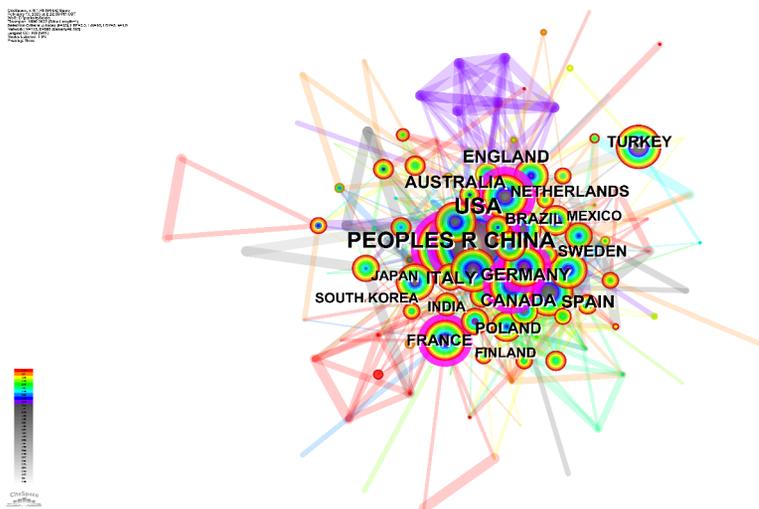


Figure 2. Country collaboration network of park city from 1982 to 2022

cooperative relationship between countries. The scientific collaboration network between countries consists of 115 nodes and 688 links, and in-depth research on park city is mainly distributed in China (604 published papers), the United States (490 published papers), and Germany (139 published papers). In terms of betweenness centrality and nodes with relatively strong cooperative relationships with others, China, the United States, Germany, England, Australia, Canada, Spain, France, India, and the Netherlands. These countries play significant roles in fostering collaborative efforts within the research community pertaining to park city.

2.2. Co-citation analysis

The co-citation cluster network generates names by extracting nominal terms from the titles, keywords, and abstracts of cited literature, and the effectiveness of this method has been proven by studies in different fields (Trujillo & Long, 2018). The co-citation network consists of 966 nodes and six co-citation clusters are presented in 3. The modularity Q value is 0.5369, and the clustering

structure is highly reasonable. The weighted mean silhouette is 0.8001, and the harmonic mean is 0.6426, indicating a reliable quality of each cluster (Chen & Song, 2019). In general, the fundamental research content of park city is clustered into six categories, including urban ecology, cultural ecosystem service, industrial symbiosis, ecosystem services, urban heat island, and environmental justice. These clusters reflect the significant areas of investigation and discourse within the field of park city research.

Cluster #0, “Urban Ecology,” stands as the largest cluster with 169 members. The most relevant citations within this cluster focus on urban biodiversity perception, the promotion of ecosystem services, and the assessment of the value of ecological environments (Botzat et al., 2016). Cluster #1, “Cultural Ecosystem Service,” comprises 126 members, with the most relevant citations focusing on urban park visitation, perceived health benefits, and appreciation of ecosystem services (Kabisch et al., 2021). Cluster #2, “Industrial Symbiosis,” comprises 111 members, and the most relevant citation within this cluster focuses on human settlements and air quality (Schipperijn

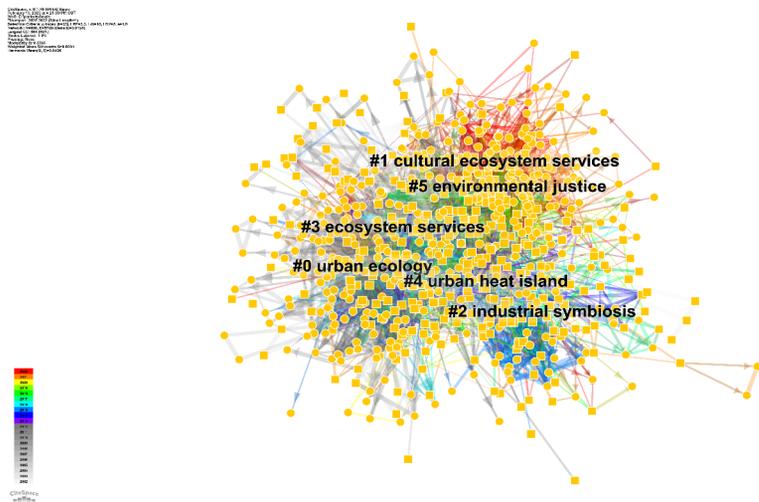


Figure 3. Co-citation map of the international literatures about park city from 1982 to 2022

et al., 2010). Cluster #3, “Ecosystem Services,” also comprises 111 members, and the most relevant citations to this cluster focus on spatial quality assessments of urban green spaces, multifunctional ecosystem services, and sustainable development (Lo & Jim, 2010; Kraemer & Kabisch, 2021). Cluster #4, “Urban Heat Island,” has 86 members, and the most relevant citation in this cluster focuses on reducing green space, population mobility, and carbon emissions (Green et al., 2016). Cluster #5, “Environmental Justice,” consists of 84 members, and the most pertinent citations within this cluster exploring environmental development and urban ecosystems (Savard et al., 2000; Cohen et al., 2014). These co-citation clusters serve as valuable frameworks for understanding the key themes and research directions within the domain of park city research.

2.3. Emerging research trends

The 15 most representative keywords with the highest citation bursts are presented in Figure 4. Over the past four decades, the research hotspots in the field of park city have shown a dynamic evolution, leading to more diverse and in-depth content. Certain keywords, including “ecology”, “gradient”, “vegetation”, “forest”, “urban ecology”, and “conservation”, have been consistently remained relevant in related research fields. Additionally, “restoration” has emerged as a prominent research hotspot in 2020–2022, indicating a growing interest and focus on restoration efforts within park city research.

In this study, the concept, pattern, function, and welfare of park city construction were analyzed, as depicted in Figure 5. The concept of park city construction

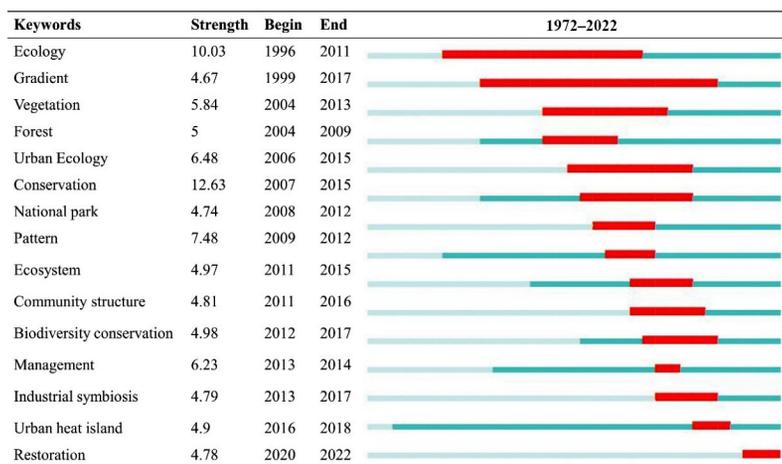


Figure 4. Prominent keywords burst detection of park city from 1982 to 2022

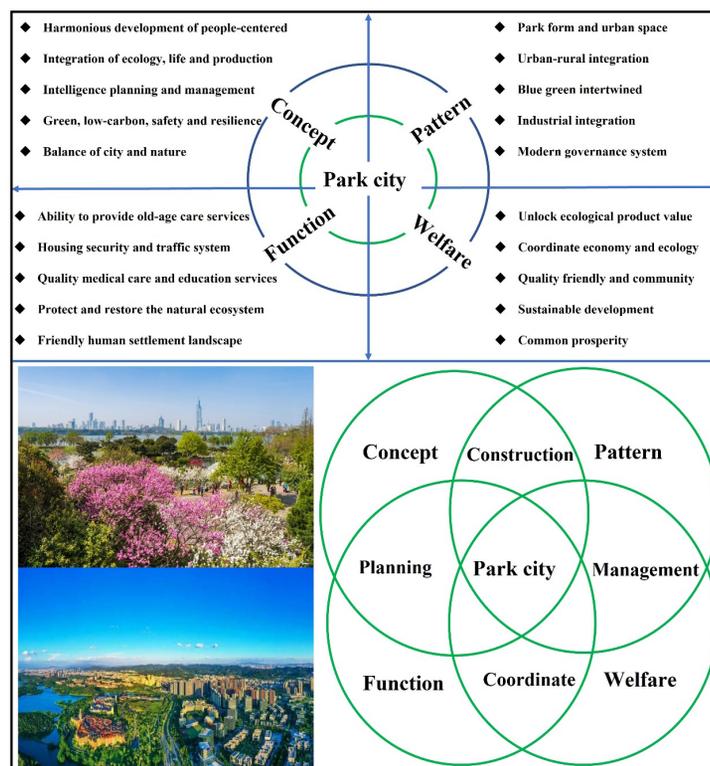


Figure 5. The connotation of park city in China

encompasses key principles such as people-centered, harmonious development, integration of ecology, life, and productivity, intelligent planning and management, as well as a commitment to green, low-carbon, safe, and resilient development ideals. Urban development has progressed from garden city, ecological city, green city, landscape city, garden city, ecological garden city to park city, and the relationship between ecosystem and environment has gained greater attention in the process of landscape planning, design, and construction. In terms of landscape evaluation, more emphasis has been placed on the relationship between biodiversity and human beings, ecosystem service function and evaluation, urban restoration, and sustainable development (see Figure 4 and Figure 5). By analyzing these aspects, this study sheds light on the multifaceted dimensions of park city construction, advancing our understanding of its significance in fostering sustainable urban environments and enhancing the well-being of residents.

3. Discussion

3.1. Research topics

Park city is an innovative practice in China's ecological civilization construction at the city scale. Diverging from traditional ecological city concepts, it places significant emphasis on fostering fair urban sharing, driving the transformation of ecological values, and enhancing the overall well-being of the populace. While research on park cities in the United States commenced earlier, it gained momentum in China with the introduction of relevant policies (see Figure 1). Within the framework of China's 21st-century socialist system, the concept of park city seeks to establish connections and coordination between urban areas, embodying a systematic, holistic, and interactive landscape that integrates public spaces, ecological elements, aesthetics, livable environments, and green economic development. This creates a public green circulation system with ecological, aesthetic, and economic values (Huang et al., 2022; Mullenbach, 2022). With a people-oriented approach at its core, park city endeavors to meet diverse needs, such as transportation, fitness and leisure activities, communication, and social interaction, thereby enriching people's lives. This encompasses the establishment of urban roads, preservation of ecological resources, provision of open spaces, and the creation of a three-dimensional channel system to facilitate ease of movement and access (see Figure 5). By focusing on these human-centric aspects, park city not only reinforces ecological integrity but also seeks to foster vibrant and harmonious urban environments for the betterment of society as a whole.

After conducting an analysis of the co-citation clusters, it becomes evident that research on park city is multifaceted, with prominent focuses on urban ecology, cultural ecosystem services, industrial symbiosis, ecosystem services, urban heat island, and environmental justice (see Figure 3). In China, continuous efforts have

been made to implement policies aimed at enhancing eco-environmental quality and promoting human welfare. The core tool of park city is the "park," facilitating the harmonious development of urban areas and their natural surroundings. The concept has undergone a transformation from a materialistic emphasis to a people-oriented one, with a strong focus on fair sharing and accessibility. This concept plays a crucial role in promoting sustainable development in the new era of socialist construction (Zhang et al., 2023). The presence of accessible and well-utilized city park has been found to be positively correlated with the availability of open green spaces within a community, enabling enhanced social interaction and fostering strong community relationships (Ishikawa & Fukushige, 2012; Zhang et al., 2021; Mu et al., 2022). The characteristics of park city planning and management systems encompass spatial scale suitability, a unique landscape image, and spatial organization integrity. Through the reinforcement of park city practices, the utilization of local natural and cultural resources, and the establishment of livable, harmonious, ecological, and environmentally-friendly modern cities, a comprehensive urban and rural development plan can be formulated, fostering the integration of urban and rural areas and facilitating the development of park city. This integration is vital in achieving the overarching goal of promoting sustainable and balanced urban growth.

3.2. Development tendency

Drawing from traditional landscape philosophy, the concept of urban construction has evolved from advocating natural landscape to creating landscape cities. This evolution has seen a shift from considering single factors to integrating multiple aspects encompassing nature, society, and culture. Increasingly, there is a greater emphasis on the ecological and social benefits of the entire ecosystem, surpassing a mere focus on the aesthetic appeal of the landscape (Xue et al., 2015). Previous studies have predominantly concentrated on assessing the ecological value of either natural or urban ecosystems, with limited attention given to the organic integration of urban residents' demands and the benefits derived from the natural ecosystem for spatial value evaluation (Vallecillo et al., 2019). Developed countries have undertaken extensive research on park city, particularly delving into the material, cultural, and social ecological benefits (see Figure 2 and Figure 3). Cultural ecosystem services, which encompass the non-material benefits that humans derive from the ecosystem through spiritual life satisfaction, cognitive development, entertainment, and aesthetic experiences, present a challenging aspect of ecosystem service evaluation (Scholte et al., 2015; Wang et al., 2021). In the future, the development of park cities will increasingly prioritize the benefits to human spirit, encompassing cultural landscapes, recreation spaces, public education, and more. This domain is expected to witness a peak in research on cultural service evaluation methods as scholars and practitioners explore novel ways to comprehensively understand

and promote the diverse array of benefits that park cities offer to humanity.

The saying “clear water and green mountains are worth their weight in gold and silver” emphasizes the immeasurable value of a good ecological environment, which can continuously generate comprehensive benefits, leading to sustainable economic and social development. In the future, the development of park city will prioritize social benefits and human well-being over traditional urban construction approaches. Currently, much research in this area focuses on urban planning and construction, including landscape planning and evaluation, construction engineering, and housing prices (Liu et al., 2022; Huang et al., 2023). However, as the issue of harmonious coexistence between nature and human gains increasing importance, hot topics like urban park landscapes, green spaces, and ecological environments will continue to be active in the park city research field (Dade et al., 2020). In this study, the keywords of spatial equity and cultural ecosystem services reflect the positive impact of urban parks, forests, and green spaces on human well-being. To achieve a better balance between ecological and economic development, creative transformations of ecological value, and a stronger connection between nature and humans, domestic scholars in this field can focus on ecosystem services and value assessments to measure the benefits that humans derive from the ecosystem. This approach will offer valuable insights into optimizing park city development strategies and fostering a more harmonious and sustainable relationship between urban environments and their natural surroundings.

3.3. Sustainable development path in China

In the contemporary era, park city serves as a tangible manifestation of ecological civilization within China's urban construction landscape (Han et al., 2021). The development of park city represents an inevitable pathway towards establishing an eco-friendly, habitable, beautiful, and comfortable living environment (Bottero et al., 2022). Researchers approach the study of ecosystem service capacity from the standpoint of harmonious integration of “human” and “ecology,” seeking suitable construction techniques to address any shortcomings (Breuste & Quereshi, 2011; Ayala-Azcarraga et al., 2019). Achieving an optimal urban development mode, enhancing urban ecological value, and refining national policies necessitate joint exploration and the combined efforts from both urban administrators and citizens. This collaborative approach is vital to ensure the success of park city initiatives, fostering a harmonious relationship between nature and urban life, and promoting the well-being of residents. By embracing this shared vision and working together, urban planners, policymakers, and citizens can collectively contribute to the creation of sustainable, resilient, and livable urban environments for current and future generations.

To promote the development of park cities, several key steps can be undertaken. Firstly, the park layout should be

more closely integrated with urban area planning, ensuring coordination within the multi-level spatial planning system. Rather than solely focusing on the “green space system”, the emphasis should shift towards the “park system” and the creation of immersive scene space. By adopting an approach that prioritizes people's needs and preferences, the transformation from space construction to scene shaping can cultivate a stronger sense of belonging and enrich the overall scene experience. Secondly, there should be a concerted effort to improve the exploitation and utilization rate of resources, with a particular focus on fostering a circular economy. This entails creating an economic growth model characterized by high added value of products, low resource consumption, and reduced environmental pollution. By enhancing the capacity for sustainable development, urban tourism can be further promoted, and high-quality resources can be effectively integrated. Lastly, active citizens participation in the construction of park cities should be encouraged. This can be achieved through various means, including guiding citizens to opt for public transportation, walking, shared bikes, and other low-carbon modes of travel. Additionally, there should also be an exploration of planning, implementation, and governance mechanisms that facilitate the joint development of nature and the city. This holistic approach ensures that broad benefits are extended to the people, fostering a sense of collective ownership and pride in the creation of vibrant and sustainable park cities.

Conclusions

In the context of accelerating urbanization, the interplay between ecological civilization and urban development becomes increasingly intertwined. This article delves into the feasibility and necessity of cultivating harmonious coexistence between humans and nature through the creation of park city. Embracing parks as a fundamental tool, park cities leverage ecological foundations to foster, realize, and transform urban values, embodying a vision of public cities characterized by openness, sharing, accessibility, and inclusiveness. The pursuit of sustainable development in park city necessitates a focus on robust urban planning and effective management practices. Citizen participation plays a pivotal role in fostering a sense of ownership and shared responsibility in the co-development of nature and urban areas. By enhancing the social and environmental functions of cities, park city can bolster its social resilience, leading to sustainable and enduring human prosperity. Future research endeavors, refining evaluation indicators for the social resilience, living environment, and theoretical system of park city should be a priority. This will enable the exploration of innovative sustainable development paths, paving the way for new visions to shape the future of cities. In conclusion, the creation of park cities emerges as a transformative approach to forging a sustainable and balanced relationship between humanity and the environment in the realm of urban development. By embracing the principles of openness, inclusivity, and

ecological harmony, park cities stand poised to become beacons of sustainable prosperity, inspiring a brighter and greener future for urban living.

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Author contributions

Xiaohang Bai: conceptualization, methodology, formal analysis, investigation, writing-original draft preparation, writing-review and editing, visualization, supervision, funding acquisition. Sehrish Sadia: methodology, formal analysis, investigation.

Disclosure statement

No potential conflict of interest was reported by the authors.

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