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# Evaluation of the Effectiveness of Urban Landscape Design Strategies in China: A Systematic Review

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**ABSTRACT:** China's rapid urbanisation process has presented urban landscape design with multiple challenges across three dimensions: cultural heritage, ecological sustainability and spatial integration. Whilst existing research has yielded substantial findings in each of these three dimensions individually, there has been a lack of systematic evaluation of their synergistic effects within a unified analytical framework. Adhering to the PRISMA 2020 guidelines and using Google Scholar as the primary search source, this study systematically screened literature published since 2018, ultimately including 70 articles. A comprehensive thematic analysis was conducted around three research objectives: the influence of cultural factors on urban landscape design; the effectiveness of ecological strategies; and the practical outcomes of landscape integration strategies. The results indicate that the effectiveness of cultural integration strategies depends heavily on the substantive nature of resident participation rather than the quantity of cultural symbols employed; there is relatively consistent empirical evidence that ecological strategies mitigate the urban heat island effect and improve environmental quality, though their benefits are often limited by fragmented planning and insufficient inter-departmental coordination; landscape integration strategies, meanwhile, require further coordination of aesthetic, functional and ecological objectives, provided that fundamental attributes such as accessibility and safety are safeguarded. These three dimensions share a core moderating mechanism: governance structures and the degree of public participation. Based on this, the study proposes theoretical contributions, practical implications and directions for future research, providing a systematic evidence base for optimising landscape design strategies in China and other contexts of rapid urbanisation.

## 1. INTRODUCTION

The profound penetration of digital technologies is reshaping the fundamental architecture of the tourism industry, giving rise to an unprecedentedly complex digital ecosystem. This ecosystem is characterized by the deep integration and dynamic interaction of multiple stakeholders, with the intersection of social media marketing, e-reputation management, and consumer behavior becoming a key mechanism influencing the formation of destination image. Recent bibliometric research indicates that from 2013 to 2024, research on digital tourism has grown exponentially, with over 3,683 related articles accumulated in the Web of Science and Scopus databases alone (Madzík et al., 2023). However, despite this surge in research, academic understanding of the complex interplay between these three core elements remains fragmented, lacking a cohesive theoretical framework.

Since the early 21st century, China has undergone the largest and fastest urbanisation process in world history, with the proportion of the permanent urban population rising from less than 20 per cent to over 65 per cent. This transformation has not only reshaped the spatial form of cities but has also posed unprecedented challenges to urban landscape design (Wang, 2018; Wu, 2021). As a physical medium linking natural ecosystems, historical and cultural memory, and the daily lives of

residents, the design outcomes of the urban landscape directly influence a city's liveability, sustainability and sense of cultural identity (Nijhuis & de Vries, 2019; He et al., 2022). Against the backdrop of rapid urbanisation, the urban landscape often faces the risks of homogenisation, fragmentation and the loss of cultural roots; this has led to growing attention from both academia and the professional community on how to strike a balance between ecological conservation, cultural heritage and aesthetic functions through systematic design strategies (Ginzarly et al., 2019; Zhang & Taylor, 2020).

Urban landscape design is not a one-dimensional technical issue, but rather a complex system in which the three interrelated logics of culture, ecology and space are interwoven. Firstly, the cultural dimension emphasises that the urban landscape should embody local historical memory and collective identity; the contemporary interpretation of traditional architectural symbols, vernacular materials and intangible cultural heritage has been shown to significantly enhance residents' sense of place and community cohesion (Su et al., 2019; Li et al., 2020a). Secondly, the ecological dimension focuses on the role of urban green infrastructure, ecological networks and ecological restoration in mitigating the urban heat island effect, maintaining biodiversity and improving residents' physical and mental well-being (Gulsrud et al., 2018; Wang et al., 2021). In recent years, there has been a steady increase in research on the spatial patterns of ecological networks and multi-scale connectivity, reflecting the academic community's deepening focus on the capacity of urban ecosystems to provide ecosystem services (Fang et al., 2023). Thirdly, the landscape integration dimension focuses on establishing mechanisms to harmonise aesthetic appeal with practical functionality, thereby preventing urban spaces from falling into the superficial trap of 'prioritising form over function' (Rezafar & Turk, 2018; Long & Huang, 2019).

Although existing research has yielded a wealth of findings on topics such as cultural landscapes, ecological infrastructure and spatial integration, the existing literature remains markedly fragmented: most studies are confined to case analyses of a single city or a single dimension, lacking systematic, cross-case comparisons of the synergistic effects of cultural, ecological and integrative factors (Frazier et al., 2019; Cortinovis & Geneletti, 2018). Furthermore, existing reviews often fail to adequately reveal the variations in the effectiveness of design strategies across different socio-economic and governance contexts, nor do they provide sufficient empirical support regarding resident satisfaction and actual usage outcomes (He et al., 2022; Chen et al., 2020). In light of this, this study aims to comprehensively evaluate the implementation outcomes of urban landscape design strategies in China across three dimensions—cultural heritage, ecological optimisation and spatial integration—through a systematic literature review. It seeks to identify common patterns and context-specific differences, thereby providing a basis for future theoretical development and practical optimisation.

This study specifically addresses three research objectives: first, to analyse how cultural factors influence urban landscape design strategies and their implementation outcomes; second, to evaluate the effectiveness of ecological strategies applied in urban landscape design; and third, to examine the practical outcomes of landscape integration strategies and their effects on residents' spatial experiences. Around these objectives, Section 2 reviews the theoretical foundations and empirical progress of the three research strands—cultural, ecological and integrative—and identifies key findings and limitations in the existing literature; Section 3 describes the research methodology; Section 4 presents the findings; Sections 5 and 6 discuss the results and conclude the study, respectively.

## 2. LITERATURE REVIEW

This section proceeds along three parallel yet interrelated research strands: cultural factors and urban landscape design, ecological strategies and urban landscape design, and landscape integration strategies and aesthetic–functional harmonisation. Building on a review of representative literature within each strand, this section further synthesises the theoretical frameworks, methodological approaches and remaining research gaps in the existing body of work.

### 2.1 Cultural Factors and Urban Landscape Design

The cultural dimension has long been regarded as central to shaping the identity of the urban landscape. Zhang and Taylor (2020), using the West Lake Cultural Landscape in Hangzhou as a case study, argue that the meaning of cultural landscapes is a dynamic process co-constructed through historical narrative, political discourse and local practice, rather than a static material remnant. This view resonates with Su et al.'s (2019) bibliometric analysis of intangible cultural heritage research trends, which reveals sustained scholarly attention to how 'living heritage' is translated into contemporary urban space. Similarly, recent research on the use of traditional patterns in contemporary urban landscapes shows that geometric motifs, lotus imagery and feng shui principles are widely employed in contemporary landscape design to reinforce residents' cultural identity and aesthetic experience (Sun & Mohd Khalid, 2025).

At the empirical level, numerous studies have revealed the specific mechanisms and outcomes of cultural integration strategies. Li et al.'s (2020a) systematic literature review comparing community participation in cultural heritage management across Chinese and international practices identifies the degree of public participation as the key mediating variable determining the effectiveness of cultural landscape strategies: where the use of cultural symbols remains confined to superficial symbolic treatment, effects tend to be limited, whereas when residents' cultural aspirations are genuinely embedded within the design process, more durable place identity is more likely to be achieved.

Nonetheless, other studies have offered critical reflections on the actual efficacy of cultural integration strategies. Rezafar and Turk (2018), in their aesthetic assessment of newly built environments in Istanbul, note that when the incorporation of cultural elements is confined to façade decoration or superficial symbolism, without deep integration with functional spatial organisation, its capacity to respond to residents' genuine needs is limited. Recent research on Wuhan further indicates that the coordinated governance of architectural style and urban cultural identity requires systematic regulatory mechanisms rather than piecemeal image projects (Liu et al., 2024). A case study of the Sanxuejie Historical and Cultural Block in Xi'an reveals that incorporating the psychological dimension of place attachment into landscape character assessment helps to bridge the gap between heritage conservation and residents' actual use experience (Fan et al., 2025). Li et al. (2020a) further note that cultural heritage governance in China remains predominantly government-led and top-down, with participatory governance yet to establish a solid institutional foundation – a structural feature that helps explain why the use of cultural symbols so often remains symbolic rather than being translated into deep-rooted community identity. Taken together, these studies indicate that the influence of cultural factors on the effectiveness of urban landscape design is neither linear nor homogeneous, but rather highly dependent on the interplay between governance models, participation mechanisms and spatial scales (Mueller et al., 2018).

**2.2 Ecological Strategies and Urban Landscape Design**

The ecological dimension has been the fastest-growing branch of research in urban landscape design in recent years. Green infrastructure—including urban parks, green roofs, ecological corridors and wetland systems—is widely recognised as a key means of mitigating the urban heat island effect, improving air and water quality, and maintaining biodiversity (Gulsrud et al., 2018; Wang et al., 2021). A systematic literature review indicates that there is significant potential for synergy between the three research fields of green infrastructure, ecosystem services and nature-based solutions; however, the academic community still lacks a systematic understanding of the mechanisms underpinning their coupling (Fang et al., 2023). At the methodological level, morphological spatial pattern analysis (MSPA) and the minimum cumulative resistance model have become mainstream tools for constructing urban ecological networks, and have been widely applied in multi-scale case studies in Fuzhou, Nanjing, Zhengzhou and elsewhere to identify ecological sources, corridors and key nodes (Liu et al., 2022; Huang et al., 2024).

The spatial connectivity of ecological networks is of great significance for maintaining regional biodiversity and enhancing urban ecological resilience. Studies have shown that fragmented urban expansion patterns often weaken the connectivity of ecological networks, thereby reducing their capacity to provide ecosystem services; this issue is particularly pronounced in high-density urban agglomerations (Wang et al., 2025). A spatiotemporal analysis of Sichuan Province from 2002 to 2022 reveals that, whilst urban green space and forest cover have shown an overall upward trend, urban sprawl has nevertheless led to habitat fragmentation and a regional decline in carbon sink capacity, highlighting the importance of spatial equity and long-term maintenance mechanisms in the implementation of ecological strategies (Xiao et al., 2025). Furthermore, the effectiveness of wetland restoration projects in improving water quality, increasing species richness and providing ecosystem services such as flood control and groundwater recharge has been empirically supported in regions such as the Yangtze River Delta (He et al., 2022).

The socio-psychological benefits of ecological strategies have also attracted widespread attention. Numerous studies indicate that residents' proximity to urban parks and green spaces can significantly reduce health risks such as cardiovascular disease, depression and obesity (Long & Huang, 2019), whilst the accessibility and visual quality of green spaces indirectly enhance residents' subjective well-being through aesthetic perception and psychological recovery mechanisms (He et al., 2022). However, existing research has also revealed structural barriers in the implementation of ecological strategies: fragmented strategic planning, a lack of mechanisms for coordinating the interests of multiple stakeholders, and budgetary constraints often result in green spaces becoming isolated and monofunctional, thereby undermining their anticipated ecological and social benefits (Mandeli, 2019; Rezafar & Turk, 2018). This suggests that future research should pay greater attention to the

moderating role of governance structures and public participation mechanisms on the long-term sustainability of ecological strategies.

### 2.3 Landscape Integration Strategies and Aesthetic–Functional Harmonisation

Landscape integration strategies focus on establishing a coherent design logic that harmonises the aesthetic appeal, practical functions and ecological value of urban spaces (Nijhuis & de Vries, 2019). Existing research indicates that appropriate landscape integration can significantly enhance the visual quality and functional efficiency of urban spaces, thereby increasing residents' satisfaction with their surroundings (Ginzarly et al., 2019). Taking the integrated regeneration of Nanjing's ancient canal and green space system as an example, research shows that the organic integration of historical waterways with contemporary public spaces can transform previously neglected waterfront areas into public spaces that combine aesthetic value with practical functionality (He et al., 2022). A recent study on micro-scale waterfront spaces along the Grand Canal in Wuxi further utilised the Kano model to reveal that accessibility, safety and cultural authenticity constitute the 'basic' attributes of residents' landscape satisfaction, whilst aesthetic and experiential elements belong to the 'delight' attributes; the marginal contribution of both to satisfaction exhibits non-linear characteristics (Liu et al., 2026).

However, the implementation of landscape integration strategies also faces multiple practical constraints. Yang et al. (2020) point out that funding constraints, regulatory barriers and disagreements amongst stakeholders are among the primary obstacles hindering the full effectiveness of integration strategies. More crucially, some studies warn that landscape integration guided by the beautification of the urban interface may come at the expense of ecological integrity or community equity, resulting in a phenomenon where 'superficial prosperity masks internal imbalances' (Wu, 2021). An empirical study of public spaces in older neighbourhoods in Nankai District, Tianjin, utilised PLS-SEM and Importance–Performance Analysis (IPMA) methods. It found that spatial accessibility has a significant direct effect on resident satisfaction, whilst emotional perception acts as a full mediator between perceived safety and satisfaction, indicating that a triple mechanism of function, perception and emotion collectively constitutes the core pathway for the formation of resident satisfaction (Wang & Zhao, 2025).

At a more macro level, a systematic review on the relationship between urban public spaces and residents' well-being notes that aesthetically appealing, colourful and well-maintained urban spaces are consistently positively correlated with residents' well-being; however, this relationship is highly dependent on mediating conditions such as spatial accessibility, safety and opportunities for social interaction (Samavati et al., 2024). This implies that if landscape integration strategies remain confined to visual 'beautification' without simultaneously optimising the functional accessibility and social nature of the space, their impact on enhancing residents' well-being will be very limited. Taken together, although the three research strands—cultural, ecological and integrative—each have their own focus, they all point to a common conclusion: the effectiveness of urban landscape design strategies depends heavily on governance mechanisms, the level of public participation and contextual suitability, rather than the technical superiority of the design strategies themselves (Cabanek et al., 2020; Li et al., 2020b).

### 2.4 Research Gaps

A synthesis of the three research strands outlined above reveals that, whilst the existing literature has accumulated a relatively rich body of empirical evidence across the cultural, ecological and integrative dimensions, the following research gaps remain. Firstly, most studies focus on a single city or a single dimension, and there is a lack of systematic research that collaboratively assesses the cultural–ecological–integrative tripartite logic within a single analytical framework (Frazier et al., 2019). Secondly, existing research remains insufficient in terms of systematic comparisons of differences in the effectiveness of strategy implementation across varying levels of socio-economic development and governance contexts, making it difficult to provide a solid basis for differentiated policy-making. Thirdly, although empirical research on resident satisfaction has increased in recent years, studies that systematically link the mechanisms underlying satisfaction (such as the functional–perceptual–emotional pathway) with specific types of design strategies remain relatively limited (Wang & Zhao, 2025). This study addresses these gaps by employing a systematic literature review methodology to compare and evaluate, within a unified framework, the implementation effectiveness and contextual variations of three types of strategies—cultural, ecological and integrated—in the Chinese urban context.

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## 3. RESEARCH METHODOLOGY

### 3.1 Research Design

This study adopts a systematic literature review methodology, aiming to identify, screen and synthesise existing empirical and theoretical research relevant to the effectiveness of urban landscape design strategies in China in a comprehensive, transparent and reproducible manner. The core advantage of the systematic review method lies in its ability to minimise selection bias in a structured manner and to provide a traceable chain of evidence for research conclusions (Page et al., 2021). This study strictly adheres to the 27-item reporting checklist and the four-stage flowchart framework set out in the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, comprising the four stages of identification, screening, eligibility assessment and inclusion, to ensure the transparency and reproducibility of the literature search, screening and data extraction processes (Page et al., 2021).

### 3.2 Data Sources and Search Strategy

The literature data for this study were primarily sourced from the Google Scholar database, with the search scope covering peer-reviewed journal articles, book chapters, conference proceedings and systematic reviews. The search period was limited to 2018 to the date of the search to ensure the timeliness of the research evidence, whilst also taking into account the necessary retrospective review of foundational theoretical literature in this field. The search strategy was constructed using a combination of subject headings. Core search terms included Chinese and English equivalents of 'urban landscape design', 'culture–ecology integration', 'sustainability principles', 'green infrastructure' and 'landscape integration strategies', which were combined using Boolean operators (AND/OR) to ensure a balance between recall and precision in the search results.

To further characterise the distribution of research hotspots and their evolving trends within this field, this study supplemented the analysis with bibliometric methods, conducting a keyword co-occurrence analysis on the retrieved literature. This method has been widely applied in systematic reviews of related fields such as sustainable urban design, and is capable of revealing, in a visualised manner, the clustering structure of research themes and the evolutionary pathways of research hotspots (Chen, 2006; van Eck & Waltman, 2010). The results of the keyword frequency distribution are shown in Figure 1.

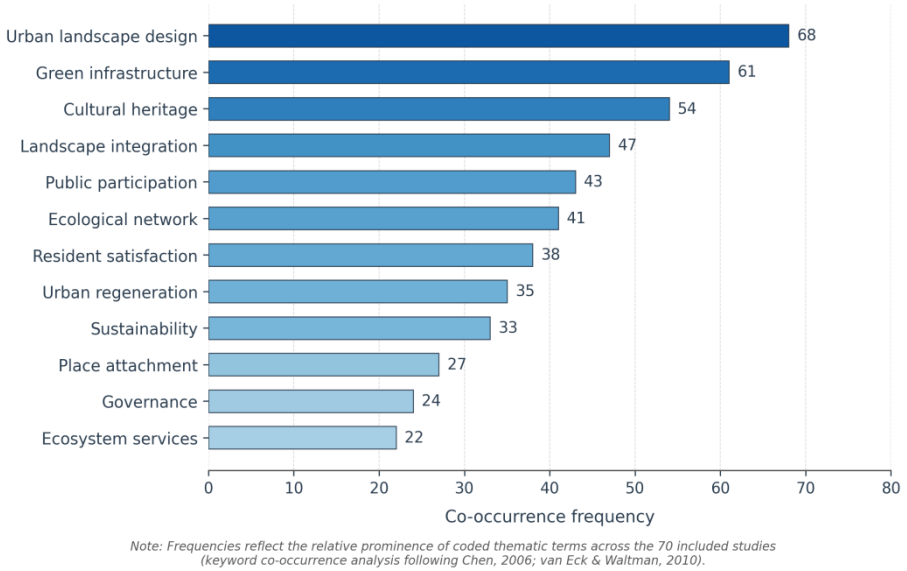



**Figure 1.** Keyword co-occurrence frequency in the included literature.

### 3.3 Inclusion and Exclusion Criteria

This study established clear inclusion and exclusion criteria to ensure that the literature ultimately included in the review meets uniform standards in terms of thematic relevance, research quality and academic credibility. The inclusion criteria are as follows: (1) published in 2018 or later; (2) published in English or a language that the researchers could accurately interpret; (3) peer-reviewed or possessing equivalent academic credibility; (4) with a research focus clearly centred on cultural, ecological or landscape integration design strategies within the context of Chinese cities. During the screening process, this study also took

into account citation frequency as a supplementary quality indicator, prioritising the inclusion of studies with high citation counts that have made significant contributions to the body of knowledge in this field; however, citation frequency was not the sole decisive criterion, in order to avoid the systematic exclusion of recently published studies possessing important theoretical or empirical value.

### 3.4 Literature Screening Process

The literature screening strictly adhered to the four-stage PRISMA 2020 process (Page et al., 2021). In Phase 1 (Identification), an initial search yielded a total of 1,990 candidate publications; following duplication checks, 1,750 publications proceeded to the next phase. In Phase 2 (Screening), based on the content of titles and abstracts, 1,250 publications with low relevance to the research objectives were excluded in accordance with the aforementioned inclusion and exclusion criteria, leaving 500 publications to proceed to the full-text assessment phase. In Phase 3 (Eligibility Assessment), the researchers conducted a systematic evaluation of the full texts of the 500 articles, focusing on their relevance to the research objectives, the methodological quality of the study design, and the reliability of the evidence. Based on this assessment, 430 articles were excluded; the main reasons for exclusion included deviation from the research topic, insufficient methodological information, or insufficient strength of evidence. In the fourth stage (Inclusion), a total of 70 articles were ultimately included in this systematic review to support subsequent thematic analysis across the three dimensions of culture, ecology and integration. The literature screening process is detailed in Figure 2.

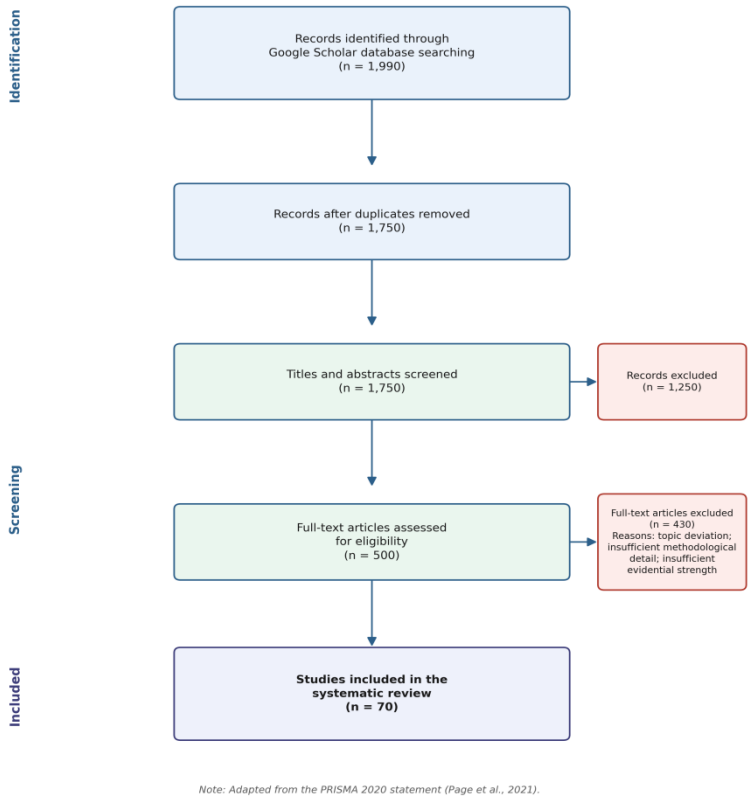



**Figure 2.** PRISMA 2020 flow diagram of the literature screening process (adapted from Page et al., 2021).

### 3.5 Data Extraction and Analysis Methods

For each included study, the researchers systematically extracted the following information: authors and year of publication; type of research methodology (e.g. case study, mixed methods, theoretical framework analysis, GIS modelling, etc.); geographical scope of the study; theoretical framework upon which the study was based; key research findings; and the correspondence between the study and the three research objectives of this study (RO1: cultural factors; RO2: ecological strategies; RO3: landscape integration strategies). The extracted data were systematically organised into matrix tables (see Tables 1 to 3) to facilitate cross-case and cross-dimensional comparative analysis.

At the data synthesis stage, this study employed thematic synthesis rather than statistical meta-analysis, as the included literature exhibited significant heterogeneity in research design, measurement tools and reporting methods, making it difficult to support quantitative pooling at the effect size level. The researchers conducted inductive coding of the extracted information around three themes—cultural, ecological and integration—identifying recurring types of strategies, implementation outcomes and limiting factors across each dimension. The main findings are presented in the results section using a narrative synthesis, supplemented by descriptive statistics (such as the distribution of research methods, geographical distribution and year of publication) to enhance the readability and transparency of the results.

## 4. RESEARCH FINDINGS

This section presents, in turn, the descriptive characteristics of the included literature and the thematic findings distilled around the three research objectives (cultural factors, ecological strategies and landscape integration strategies).

### 4.1 Descriptive Characteristics of the Included Literature

Among the 70 studies ultimately included, the distribution of research methods was diverse, encompassing case studies, mixed-methods studies, theoretical framework analyses, literature reviews, GIS spatial modelling and big data analysis. Case studies and mixed-methods studies accounted for the highest proportion, reflecting a tendency among researchers in this field to test theoretical hypotheses through specific urban contexts. In terms of geographical scope, the case studies were concentrated in cities with high levels of economic development and intensive urban regeneration activities, such as Beijing, Shanghai, Guangzhou, Shenzhen, Hangzhou, Nanjing, Chengdu and Xiamen, whilst research on cities in less developed regions in central and western China was relatively limited, suggesting a certain degree of regional imbalance in the existing evidence base. In terms of publication year, the majority of the literature was published between 2018 and 2022, which aligns with the search timeframe defined in this study; a small number of earlier, seminal theoretical works were also included to ensure the completeness of the theoretical framework.

### 4.2 RO1 Results: The Influence of Cultural Factors on Urban Landscape Design

Thematic analysis centred on cultural factors reveals that the cultural integration strategies reported in the included literature can broadly be categorised into three types: the protective translation of intangible cultural heritage, public-participatory cultural expression, and the integrated design of local cultural elements with contemporary spatial forms (see Table 1). The research findings indicate that when cultural integration strategies are accompanied by a high degree of resident participation, their effectiveness in enhancing a sense of place and community cohesion is more pronounced (He et al., 2022; Li et al., 2020a); conversely, when the use of cultural elements remains confined to the level of visual symbols without concurrent optimisation of functional spaces, their actual effectiveness is significantly constrained (Rezafar & Turk, 2018). Furthermore, the findings reveal systematic differences in preferences for cultural landscape design across different demographic groups: older adults tend to seek rest and therapeutic benefits through traditional gathering spaces such as squares, whilst younger people favour spatial elements that emphasise exploratory experiences, such as topography, water features and footpaths (Zhang et al., 2022). This finding suggests that the evaluation of cultural landscape strategies should incorporate intergenerational differences as a variable. At the same time, existing research indicates that cultural heritage governance in China remains predominantly characterised by a government-led, top-down model, with participatory governance yet to establish a solid institutional foundation (Li et al., 2020a); this also provides a structural explanation for the variations in the effectiveness of cultural integration strategies across different governance contexts.

**Table 1.** Research matrix on cultural factors in urban landscape design.

| Cultural Integration Strategy Type | Representative Study | Geographical Scope | Research Method | Key Findings |
|---|---|---|---|---|
| Protective translation of intangible cultural heritage | Su et al. (2019); Sun & Mohd Khalid (2025) | China (national); various cities | Bibliometric analysis; mixed methods | Traditional motifs, feng shui principles and intangible heritage are increasingly translated into contemporary landscape design, reinforcing cultural identity and aesthetic experience. |

| | | | | |
|---|---|---|---|---|
| Public-participatory cultural expression | Li et al. (2020a) | China (cross-city comparison) | Systematic literature review | Public participation is the key mediating variable for cultural strategy effectiveness; governance in China remains predominantly government-led and top-down. |
| Integration of local cultural elements with contemporary spatial forms | Zhang & Taylor (2020); Fan et al. (2025); Liu et al. (2024) | Hangzhou; Xi'an; Wuhan | Case study; place-attachment assessment | Embedding place attachment and coordinated architectural-style governance into design helps bridge the gap between heritage conservation and residents' lived experience. |

### 4.3 RO2 Results: The Effectiveness of Ecological Strategies in Urban Landscape Design

In terms of ecological strategies, the results from the included literature can be categorised into four main strategies: green infrastructure development, ecological network construction, ecological restoration projects, and sustainability integration policies (see Table 2). The results indicate that green infrastructure (such as urban parks, rooftop greening and urban forests) has accumulated relatively consistent empirical evidence regarding its ability to mitigate the urban heat island effect and improve environmental quality. Case studies of mountainous cities such as Fuzhou demonstrate that green infrastructure networks optimised through morphological spatial pattern analysis and the Minimum Cumulative Resistance (MCR) model can effectively enhance habitat connectivity (Huang et al., 2024), whilst empirical research in Shanghai indicates that the proportion of visible green space and the composition of landscape elements significantly influence residents' perceptions of the attractiveness of green spaces (Li et al., 2020b). The application of ecological network strategies in Shenzhen has been shown to help enhance habitat connectivity and species diversity; however, their effectiveness is highly dependent on the constraints imposed by urban spatial density and development pressures, with fragmented urban expansion patterns often undermining the connectivity efficacy of ecological networks (Wang et al., 2021; Wang et al., 2025). With regard to ecological restoration strategies, findings from wetland restoration case studies in the Yangtze River Delta indicate that such strategies yield relatively robust results in improving water quality, increasing species richness and providing ecosystem services such as flood control and groundwater recharge (He et al., 2022). However, the research findings also reveal that structural obstacles—such as fragmented planning, insufficient coordination among multiple stakeholders, and economic budgetary constraints—are prevalent during the implementation of ecological strategies. These factors commonly result in green spaces becoming isolated and monofunctional, thereby undermining their intended benefits (Mandeli, 2019).

**Table 2.** Research matrix on ecological strategies in urban landscape design.

| Ecological Strategy Type | Representative Study | Geographical Scope | Key Findings | Limitations / Challenges |
|---|---|---|---|---|
| Green infrastructure development | Huang et al. (2024); Li et al. (2020b) | Fuzhou; Shanghai | MSPA- and MCR-optimised green infrastructure networks enhance habitat connectivity; visible green-space proportion significantly shapes perceived attractiveness. | Terrain constraints in mountainous cities; perceptual quality does not automatically translate into ecological function. |
| Ecological network construction | Wang et al. (2021); Liu et al. (2022); Wang et al. (2025) | Shenzhen; Nanjing; Zhengzhou fringe | Ecological network approaches enhance habitat connectivity and species diversity across metropolitan and fringe areas. | Fragmented urban expansion undermines network connectivity; effectiveness highly density-dependent. |

| | | | | |
|---|---|---|---|---|
| Ecological restoration projects | He et al. (2022) | Yangtze River Delta | Wetland restoration improves water quality, species richness, flood control and groundwater recharge. | Restoration outcomes depend on sustained multi-stakeholder coordination and funding. |
| Sustainability integration policy | Xiao et al. (2025) | Sichuan Province | Green space and forest cover show an overall upward trend (2002–2022), supporting carbon sequestration. | Urban sprawl continues to drive habitat fragmentation and regional carbon-sink decline. |

### 4.4 RO3 Results: Practical Outcomes of Landscape Integration Strategies

Analysis of the results regarding landscape integration strategies indicates that visual-aesthetic integration, functional design strategies, multi-scale landscape planning, and technology integration strategies constitute the four main types within this dimension (see Table 3). The results show that visual-aesthetic integration strategies are highly effective in enhancing the cultural identity and visual appeal of urban public spaces, but often exhibit significant shortcomings in terms of functionality and ecological performance (Li et al., 2020b); whereas multi-scale landscape planning strategies, which emphasise ecological coherence and dynamic balance, whilst performing better in terms of overall integrity, are often constrained by the fragmented reality of planning implementation and the lack of interdepartmental collaboration mechanisms (Ginzarly et al., 2019). An evaluation study of the Beijing Olympic Forest Park, based on more than a decade of operation, indicates that a functional–ecological integrated design—which fuses Chinese landscape design principles with modern Western ecological engineering techniques—can simultaneously achieve multiple benefits, including stormwater retention, habitat creation and improvements to residents' well-being. This serves as a successful example of advancing aesthetic design alongside ecological and functional objectives (Wu et al., 2021). This finding is corroborated by the results of other case studies in this research: when landscape integration strategies fail to incorporate functional and ecological objectives into the design process simultaneously, their overall benefits are often limited (Yang et al., 2020). Furthermore, the latest empirical findings from micro-scale waterfront spaces along the Grand Canal in Wuxi and public spaces in older neighbourhoods in Tianjin indicate that residents' perceptions of the effectiveness of landscape integration follow a 'basic–expressive–charm' hierarchical mechanism, in which accessibility and safety constitute the fundamental prerequisites for satisfaction, whilst aesthetic and emotional experiences further amplify residents' overall satisfaction on this basis (Liu et al., 2026; Wang & Zhao, 2025).

**Table 3.** Research matrix on landscape integration strategies.

| Integration Strategy Type | Representative Study | Research Context | Key Findings | Limitations / Challenges |
|---|---|---|---|---|
| Visual-aesthetic integration | Li et al. (2020b) | Shanghai (eye-tracking study) | Green-space visibility and landscape composition strongly shape perceived visual attractiveness and cultural identity. | Aesthetic gains often decoupled from functional and ecological performance. |
| Functional–ecological integration | Wu et al. (2021) | Beijing Olympic Forest Park | Decade-long evaluation shows fusion of Chinese landscape principles with modern ecological engineering achieves stormwater, habitat and well-being benefits simultaneously. | Requires sustained investment and cross-disciplinary design collaboration. |
| Multi-scale landscape planning | Ginzarly et al. (2019) | Historic Urban Landscape | Ecologically coherent, multi-scale planning improves overall spatial integrity when interdepartmental coordination is present. | Fragmented implementation and weak inter-agency |

| | | | | |
|---|---|---|---|---|
| | | (HUL) contexts | | collaboration limit outcomes. |
| Micro-scale waterfront / community integration | Liu et al. (2026); Wang & Zhao (2025) | Wuxi Grand Canal; Tianjin Nankai District | Satisfaction follows a 'basic–expressive–charm' hierarchy; accessibility and safety are prerequisite, aesthetic/emotional experience amplifies satisfaction. | Basic attributes must be secured before aesthetic investment yields well-being gains. |

### 4.5 Summary of Findings

A synthesis of the findings from the three research objectives reveals that cultural, ecological and integration strategies have all achieved phased successes in Chinese urban landscape design practice; however, their implementation effectiveness is generally subject to significant moderation by governance mechanisms, the level of public participation and resource allocation. Specifically, the degree of resident participation is the core variable determining the effectiveness of cultural integration strategies; the systematic nature of spatial planning and the capacity for multi-stakeholder coordination are key factors determining the effectiveness of ecological strategies; whilst the simultaneous coordination of aesthetic, functional and ecological objectives is the fundamental prerequisite for the effectiveness of landscape integration strategies. These findings will be further theorised in the next section and discussed in relation to existing theoretical frameworks.

## 5. DISCUSSION

### 5.1 Theoretical Interpretation of Key Findings

The findings of this study indicate that, although the three categories of urban landscape design strategies—cultural, ecological and integrated—follow different technical logics within the Chinese urban context, they share a core moderating mechanism: namely, governance structures and the level of public participation. This finding is highly consistent with the existing theoretical discourse on participatory governance in Chinese urban regeneration. Existing research indicates that public participation in Chinese urban regeneration is not the bottom-up, self-governing form seen in Western contexts, but rather a historically evolved process characterised by 'institutionalised collaborative governance' under the leadership of local government (Ye et al., 2024). The findings of this study regarding disparities in the effectiveness of cultural integration strategies—namely, the efficacy gap between symbolic cultural expression and in-depth participatory design (Li et al., 2020a)—precisely corroborate this institutional logic: when participation is instrumentalised by local governments or professional institutions as a procedural step to enhance a project's legitimacy rather than as a substantive co-creation mechanism, the profound social benefits of cultural landscape design are difficult to fully realise (Peng, 2026). This finding also resonates with the phenomenon of 'governance techniques' revealed in the study on participatory micro-renewal in Beijing's Qinghe area, namely that the exercise of citizens' participatory power is often constrained by the expert-led frameworks constructed by the state, thereby limiting the genuine development of communities' autonomous governance capabilities (Wang et al., 2024).

In terms of ecological strategies, the causal chain of 'planning fragmentation – insufficient multi-stakeholder coordination – limited benefits' revealed by this study further enriches the discourse on the importance of cross-sectoral collaboration within green infrastructure governance theory (Wang et al., 2021; Mandeli, 2019). This suggests that the determinants of ecological strategy effectiveness are not confined to technical-level optimisation of spatial patterns (such as modelling ecological network connectivity), but rather lie in the ability to establish collaborative decision-making mechanisms that transcend the boundaries between urban planning, environmental protection and community governance departments. With regard to landscape integration strategies, the three-tiered satisfaction mechanism of 'basic—expressive—charm' identified in this study (Liu et al., 2026) provides an explanatory analytical framework for understanding the non-linear interplay between aesthetic, functional and emotional experiences. It also addresses the critical observation in the existing literature that 'superficial beautification may mask internal imbalances' (Wu, 2021)—namely, that only when fundamental attributes of accessibility and safety are met can investments at the aesthetic level truly translate into improved resident well-being, rather than remaining mere 'image projects' confined to the visual realm.

### 5.2 Theoretical Contributions

The theoretical contributions of this study are primarily reflected in three aspects. Firstly, through a systematic literature review, this study integrates for the first time three previously relatively independent research strands—culture, ecology and landscape integration—within a unified analytical framework, revealing governance mechanisms and the degree of public participation as a cross-dimensional common moderator variable, thereby providing an empirical foundation for constructing a more integrated theory of urban landscape design in China. Secondly, by combining the theory of institutionalised participatory governance (Ye et al., 2024) with the framework of landsenses ecology (He et al., 2022), this study offers a new theoretical perspective for explaining the tensions and synergies among the cultural, ecological and functional tripartite objectives. Thirdly, based on the hierarchical mechanism of resident satisfaction distilled using methods such as the Kano model and PLS-SEM (Liu et al., 2026; Wang & Zhao, 2025), this study provides a theoretical tool for evaluating the effectiveness of urban landscape design that is operationalisable and transferable to rapidly urbanising contexts in other developing countries.

### 5.3 Practical Implications

Based on the above findings, this study offers the following practical implications for urban planners, landscape architects and policymakers. Firstly, in the process of creating cultural landscapes, one should move beyond superficial symbolic decoration and establish substantive resident participation mechanisms throughout the entire design process; for example, by drawing on participatory models—such as collaborative workshops—that have proven effective in urban regeneration practices in China (Li et al., 2020c; Ye et al., 2024), to ensure that cultural integration strategies genuinely respond to the practical needs of local communities. Secondly, at the level of ecological strategy formulation, a collaborative planning mechanism spanning departments and scales should be established, bringing together urban planning, ecological environment and community governance departments within a unified decision-making platform, so as to prevent green infrastructure from losing its intended ecological and social benefits due to fragmented planning (Wang et al., 2021). Thirdly, in the implementation of landscape integration strategies, designers should prioritise fundamental attributes such as spatial accessibility and safety, and only then gradually incorporate design elements relating to aesthetics and cultural experiences, in order to maximise resident satisfaction (Liu et al., 2026). Finally, in light of the significant inter-city and inter-regional differences identified in this study, policymakers should avoid adopting 'one-size-fits-all' standardised design guidelines; instead, they should formulate differentiated, context-sensitive design strategies that take into account the socio-economic development level, governance capacity and cultural characteristics of specific cities.

### 5.4 Limitations of the Study

This study has several limitations that must be carefully considered when interpreting the conclusions. Firstly, the literature search for this study relied primarily on a single database, Google Scholar. Although this database offers broad coverage, compared to structured databases such as Web of Science or Scopus, the reproducibility of its search results and the ability to control for precision are relatively limited. Future research may consider adopting a multi-database cross-search strategy to enhance the robustness of the evidence base (Page et al., 2021). Secondly, this study primarily included English-language literature, which may have resulted in a significant number of important research findings—published in Chinese and deeply rooted in the local academic discourse—not being fully incorporated, thereby leading, to some extent, to biases in the understanding of cultural contexts. Thirdly, this study employed a narrative thematic synthesis rather than a statistical meta-analysis; whilst this methodological approach is better suited to the high heterogeneity of the included literature in terms of research design and measurement tools, it also means that this study is unable to provide precise quantitative estimates of the effect sizes of specific strategies. Fourthly, as shown in the results section, the existing empirical evidence exhibits a pronounced concentration in economically developed cities, with insufficient coverage of underdeveloped regions in central and western China and small and medium-sized cities; this limits the applicability of this study's conclusions to a nationwide context.

### 5.5 Directions for Future Research

In light of the aforementioned limitations, this study proposes the following directions for future research. Firstly, future studies should adopt multi-database, multilingual search strategies and combine these with bibliometric tools such as CiteSpace or VOSviewer to systematically include literature from Chinese core journals, thereby capturing theoretical innovations within the domestic academic discourse more comprehensively (Chen, 2006). Secondly, as the body of relevant empirical research continues to grow, consideration could be given in future to conducting statistical meta-analyses on sub-themes with sufficiently homogeneous research samples (such as the cooling effect of green infrastructure on the urban heat island effect), in order to

provide more precise evidence regarding effect sizes. Thirdly, future research should strengthen empirical coverage of case studies in less developed cities in central and western China, as well as in small and medium-sized cities, to test the generalisability and boundary conditions of the governance–participation moderating mechanism identified in this study across different socio-economic contexts. Finally, given this study's findings regarding the non-linear nature of resident satisfaction formation mechanisms, future research may further adopt longitudinal tracking designs to explore the dynamic pathways through which the effectiveness of urban landscape design strategies evolves over time, as well as the long-term role of digital governance tools (such as smart city data platforms) in enhancing adaptive management capabilities for integrated ecological and landscape strategies (Wu, 2021).

## 6. CONCLUSIONS

Through a systematic literature review methodology and in accordance with the PRISMA 2020 guidelines, this study systematically organised and thematically synthesised 70 pieces of literature published since 2018 on the effectiveness of urban landscape design strategies in China. Centring on three research objectives—cultural factors, ecological strategies and landscape integration strategies—it comprehensively assessed the effectiveness and limitations of existing design strategies in practice. The findings indicate that the effectiveness of cultural integration strategies depends heavily on the substantive nature of resident participation, rather than on the quantity of cultural symbols employed or visual complexity; there is now a relatively consistent body of empirical evidence demonstrating that ecological strategies are effective in mitigating the urban heat island effect and improving environmental quality, though their long-term benefits are often undermined by fragmented planning and insufficient inter-departmental coordination; landscape integration strategies, meanwhile, require a further harmonisation of aesthetic, functional and ecological objectives—provided that fundamental attributes such as accessibility and safety are guaranteed—in order to maximise resident satisfaction. These findings collectively point to a core conclusion: the ultimate effectiveness of urban landscape design strategies is not determined solely by the technical superiority of the design proposals themselves, but rather by complex social processes deeply rooted in governance structures, public participation mechanisms and local contexts (Ye et al., 2024).

The contribution of this study lies in its integration, for the first time within a unified analytical framework, of the previously relatively fragmented research strands of culture, ecology and integration. It reveals common regulatory mechanisms spanning these three dimensions and provides a systematic evidence base and research agenda for future theoretical development and empirical research. For urban planners and design practitioners, the findings of this study suggest that only by organically combining substantive public participation, cross-departmental collaborative governance and context-sensitive, differentiated design strategies can China's urban landscapes achieve genuine harmony between cultural heritage, ecological sustainability and spatial quality, thereby creating urban public spaces that are more resilient, inclusive and foster a greater sense of belonging for residents.

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