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Visual Coherence and Residents' Perceptions of Community Green Spaces in Desert Cities: Evidence from the Hexi Corridor, China

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Abstract

Community green spaces play a critical role in enhancing urban livability, particularly in desert cities where harsh climatic conditions limit ecological resilience and outdoor social activity. However, many green spaces in arid urban environments remain fragmented, visually incoherent, and underutilised. This study investigates residents' perceptions of visual coherence in community green spaces within the Hexi Corridor of northwestern China. Using a mixed-methods approach, data were collected through a structured questionnaire survey of 406 residents, supported by photographic visual assessments and spatial observations in three representative desert cities: Wuwei, Zhangye, and Jiayuguan. Quantitative analysis reveals that several key factors, including vegetation quality, spatial organisation, accessibility, and perceived safety, shape residents' perceptions of visual coherence. The findings further show that demographic characteristics influence how users evaluate visual harmony and landscape order. The study highlights the importance of integrating perceptual quality into green space planning and provides design insights for improving ecological resilience, usability, and aesthetic coherence in desert urban landscapes.

Keywords: Visual Coherence, Community Green Spaces, Desert Cities, Environmental Perception, Urban Landscape Design

Introduction

Urban green spaces are widely recognised as essential components of sustainable cities, providing ecological, social, and psychological benefits to urban residents. These spaces contribute to environmental regulation, biodiversity conservation, and the improvement of urban microclimates while also supporting recreation, social interaction, and public health. Rapid urbanisation, however, has significantly altered the spatial structure and quality of urban green infrastructure, often leading to fragmented, poorly designed, and underutilised green spaces in many cities worldwide (Jain, 2025). Recent studies further

emphasise that the effectiveness of urban green spaces is not solely dependent on their quantity but increasingly on their quality and user experience, particularly under conditions of environmental stress and urban densification (Russo, 2024; Saeedi et al., 2025). In particular, cities located in arid and semi-arid regions face additional challenges due to water scarcity, harsh climatic conditions, and limited vegetation coverage, which complicate the planning and management of effective and sustainable green spaces.

In desert urban environments, community green spaces play a particularly important role in improving urban liveability and providing accessible recreational areas for residents. These spaces function as everyday landscapes that support neighbourhood interaction, physical activity, and psychological restoration. Nevertheless, the design and planning of such green spaces often prioritise quantitative indicators, such as green space area or distribution, while overlooking qualitative aspects such as spatial order, aesthetic consistency, and visual experience. This imbalance has been widely criticised in recent literature, which highlights that users' perceptions of landscape quality significantly influence patterns of use, satisfaction, and emotional well-being (Kong et al., 2022; Yin et al., 2023; Selanon & Chuangchai, 2023). As a result, there is a growing need to incorporate perceptual and experiential dimensions into green space evaluation and design frameworks.

Among the various attributes that shape landscape perception, visual coherence has been identified as a critical factor influencing environmental preference and landscape appreciation. Visual coherence refers to the degree to which landscape elements appear organised, harmonious, and visually connected, allowing users to interpret and navigate the environment more easily. According to landscape preference theory, environments that exhibit coherent spatial patterns and clear visual structures are generally perceived as more attractive, legible, and comfortable for users (Kaplan et al., 1989; Gülçin & Yalçınkaya, 2024). Empirical research has also shown that visually coherent landscapes enhance cognitive processing, reduce environmental stress, and improve user satisfaction (Cernicova-Buca et al., 2023). In urban landscapes, coherent design can be achieved through the deliberate arrangement of vegetation, pathways, spatial boundaries, and built elements that collectively create a unified and legible visual experience.

Despite the growing attention to landscape perception and environmental psychology in urban studies, empirical research on visual coherence in community green spaces remains limited, particularly in desert cities. Most existing studies have focused on temperate or humid urban environments, where vegetation abundance naturally contributes to landscape aesthetics and ecological function (Kong et al., 2022; Yin et al., 2023). Consequently, there is a lack of context-specific understanding of how visual coherence is perceived and evaluated under arid environmental conditions, where ecological constraints significantly restrict vegetation diversity and spatial composition. Furthermore, previous research has tended to examine general landscape quality or user satisfaction without explicitly isolating visual coherence as a distinct perceptual construct. This gap is especially critical in desert cities, where the scarcity of natural elements places greater importance on spatial organisation, design structure, and visual integration.

This challenge is particularly evident in the Hexi Corridor region of northwestern China, where urban settlements are located in arid environments characterised by sparse

vegetation, extreme climatic conditions, and fragile ecosystems. Although recent urban greening initiatives have improved the provision of green spaces in these cities, many community-level landscapes remain visually fragmented and lack coherent spatial organisation. Therefore, a systematic investigation of residents' perceptions of visual coherence in such contexts is both timely and necessary.

To address this research gap, this study investigates residents' perceptions of visual coherence in community green spaces in three representative desert cities of the Hexi Corridor: Wuwei, Zhangye, and Jiayuguan. Using a mixed-methods approach that combines questionnaire surveys, visual assessments, and field observations, the research aims to identify the key landscape attributes that influence residents' perception of visual harmony and spatial organisation. By explicitly focusing on visual coherence as a measurable and perceptual dimension, this study advances current understanding of landscape evaluation in arid urban environments.

The findings of this research provide both theoretical and practical contributions. Theoretically, the study extends landscape perception research by contextualising visual coherence within desert urban environments, an area that remains underexplored in existing literature. Practically, it offers evidence-based insights for urban planners and landscape designers seeking to improve the quality and usability of green spaces in arid regions. In particular, the study highlights the importance of integrating perceptual and aesthetic considerations into green space planning, moving beyond purely quantitative approaches toward more user-centred and visually coherent landscape design strategies.

Literature Review

Urban Green Spaces and Urban Liveability

Urban green spaces are widely recognised as essential components of sustainable urban development, providing multiple ecological, social, and economic benefits. These include improving air quality, regulating urban microclimates, supporting biodiversity, and enhancing the overall quality of life for urban residents. Research has consistently shown that well-designed green spaces contribute to both physical and psychological health by offering opportunities for recreation, relaxation, and social interaction (Selanon & Chuangchai, 2023; Russo, 2024).

However, in rapidly urbanising regions, the provision of green spaces continues to prioritise quantitative indicators such as total green space area or per capita green coverage, often at the expense of qualitative design considerations. Recent studies argue that this imbalance limits the effectiveness of green spaces in meeting users' needs, particularly in dense and environmentally constrained urban contexts (Cernicova-Buca et al., 2023; Saeedi et al., 2025). As a result, increasing attention has been directed toward understanding how design quality, rather than quantity alone, shapes user satisfaction and engagement.

The quality of urban green spaces plays a significant role in determining how frequently they are used and how residents perceive their value. Empirical studies have demonstrated that accessibility, safety, landscape design, and maintenance significantly influence residents' satisfaction and their willingness to engage in outdoor activities (Cernicova-Buca et al., 2023; Saeedi et al., 2025). In addition, the visual and aesthetic qualities of green environments have

been shown to affect users' emotional responses and psychological restoration, reinforcing the importance of incorporating perceptual dimensions into urban green space planning (Selanon & Chuangchai, 2023; Russo, 2024).

In desert and arid cities, the development of green spaces presents additional challenges due to limited water resources, extreme temperatures, and fragile ecosystems. These constraints not only restrict vegetation growth but also limit the diversity and complexity of landscape design. Consequently, urban planners must adopt innovative and context-sensitive design strategies that balance ecological sustainability with residents' needs for comfortable and visually appealing outdoor environments. In such contexts, improving the perceptual and aesthetic quality of green spaces becomes particularly important for enhancing their usability and attractiveness, yet this aspect remains insufficiently explored in existing literature.

Environmental Perception and Landscape Preference

Environmental perception refers to the process through which individuals interpret and evaluate their surrounding environments based on sensory experiences, cognitive processes, and personal values. In urban landscape research, environmental perception plays a key role in shaping how people experience and interact with public spaces. Scholars in environmental psychology emphasise that individuals do not passively observe landscapes; instead, they actively interpret them through cognitive frameworks that influence preferences, behaviours, and emotional responses.

One of the most influential frameworks in landscape perception research is the landscape preference theory proposed by Kaplan et al. (1989). According to this theory, individuals tend to prefer environments that balance two key dimensions: understanding and exploration. Understanding refers to the ease with which a landscape can be organised and interpreted, while exploration relates to the opportunities the environment provides for discovery and engagement. Landscapes that successfully integrate these dimensions are generally perceived as more attractive, legible, and comfortable.

Another important theoretical contribution is the prospect–refuge theory developed by Appleton (1975), which suggests that people prefer environments that provide both open views (prospect) and sheltered areas (refuge). Such spatial configurations allow individuals to observe their surroundings while maintaining a sense of safety and security. In urban green spaces, these design principles influence users' comfort levels, spatial preferences, and overall perception of environmental quality.

While these theoretical frameworks provide a strong foundation for understanding landscape perception, much of the existing research has focused on general environmental preferences rather than specific perceptual attributes. In particular, limited attention has been given to how distinct visual properties—such as coherence—shape users' experiences in different environmental contexts. This gap is especially relevant in urban green space research, where perceptual qualities play a critical role in influencing user behaviour.

Visual Coherence in Landscape Design

Visual coherence refers to the degree to which landscape elements appear orderly, harmonious, and visually connected. It is a central concept in landscape aesthetics and environmental design, as coherent landscapes are generally perceived as more legible, organised, and aesthetically pleasing. Visual coherence can be achieved through the consistent arrangement of vegetation, pathways, spatial boundaries, colours, textures, and architectural elements within a landscape.

Within the framework of landscape preference theory, coherence is considered a key determinant of environmental attractiveness (Kaplan et al., 1989). Landscapes that exhibit clear patterns, organised spatial structures, and consistent design elements enable users to interpret their surroundings more easily, thereby reducing cognitive effort and enhancing visual comfort. Conversely, landscapes that lack coherence may appear chaotic, fragmented, or visually confusing, negatively affecting user satisfaction and engagement.

Recent empirical studies further support the importance of visual organisation in shaping user perceptions of landscape quality and usability (Cernicova-Buca et al., 2023). Urban design research also highlights that a consistent design language, clear spatial hierarchy, and strong visual connections between landscape elements can enhance both aesthetic appeal and functional performance (Gülçin & Yalçınkaya, 2024). In community green spaces, coherent spatial organisation can improve wayfinding, facilitate social interaction, and strengthen users' sense of place.

Despite these insights, existing studies often treat visual coherence as part of broader aesthetic evaluations rather than examining it as an independent and measurable construct. This lack of focused empirical investigation limits the understanding of how visual coherence specifically influences user perception and behaviour in urban green spaces.

Visual Quality and Green Space Use in Desert Cities

While the relationship between landscape aesthetics and user behaviour has been widely studied in temperate urban environments, relatively little research has examined this relationship in desert cities. Arid urban regions typically experience limited vegetation coverage, high evaporation rates, and extreme climatic conditions, which constrain both the ecological functionality and visual diversity of green spaces. As a result, such landscapes may appear sparse, monotonous, or poorly integrated with the surrounding urban fabric.

In these contexts, improving the visual quality and coherence of green spaces becomes essential for encouraging residents to use and appreciate these environments. Strategic planting design, spatial organisation, and the integration of built landscape elements can enhance visual diversity and create more attractive and comfortable outdoor spaces. Previous studies indicate that visual attributes significantly influence user behaviour and emotional responses in green environments (Kong et al., 2022; Yin et al., 2023). However, these studies are predominantly based on non-arid settings, limiting their applicability to desert urban contexts.

Furthermore, there remains a lack of empirical research that integrates environmental perception theories with practical landscape design considerations in arid regions. Most

existing studies focus either on ecological performance or general user satisfaction, without explicitly examining how specific perceptual attributes, such as visual coherence, influence user experience. This gap highlights the need for context-specific investigations that consider both environmental constraints and human perception.

Therefore, investigating how residents perceive the visual coherence of community green spaces in desert cities is critical for advancing both theoretical understanding and practical design strategies. Such research can provide valuable insights into how perceptual quality can be optimised under ecological constraints, ultimately contributing to more sustainable and user-centred urban landscape planning in arid environments.

Materials and Methods

Study Area

This study was conducted in the Hexi Corridor region of northwestern China, a typical arid urban belt located along the historical Silk Road. The region is characterised by desert and semi-arid climatic conditions, limited annual precipitation, strong solar radiation, and fragile ecological systems. These environmental constraints pose significant challenges for urban landscape planning and the development of sustainable green spaces. Despite these limitations, urban green spaces in desert cities are essential for improving environmental quality, enhancing urban aesthetics, and supporting residents' recreational needs.

Three representative cities in the Hexi Corridor—Wuwei, Zhangye, and Jiayuguan—were selected as the case study locations. These cities share similar climatic conditions, ecological characteristics, and urban development patterns, making them suitable for comparative analysis. In recent years, local governments in these cities have increased investments in urban greening initiatives to improve environmental quality and residents' living conditions. However, many community green spaces remain limited in visual quality, spatial organisation, and functional diversity. Therefore, examining residents' perceptions of these green spaces provides valuable insights for improving urban landscape design in desert environments.

Research Design

This study adopted a mixed-methods research approach, combining quantitative and qualitative methods to evaluate residents' perceptions of visual coherence in community green spaces. The research design consisted of three main components: a questionnaire survey, a visual landscape assessment, and field observation. This integrated approach allowed the study to capture both subjective perceptions and objective landscape characteristics.

The questionnaire survey served as the primary data collection method to understand residents' perceptions of green space quality and visual coherence. The survey instrument included questions related to demographic characteristics, frequency of green space use, satisfaction with landscape design, and perceptions of visual coherence. Respondents were asked to evaluate several aspects of green space quality using a five-point Likert scale ranging from "strongly disagree" to "strongly agree." Key evaluation indicators included vegetation arrangement, spatial organisation, landscape cleanliness, accessibility, and perceived safety.

In addition to the survey, visual landscape assessments were conducted using photographic documentation and on-site observations. Photographs of representative community green spaces were analysed to examine spatial structure, vegetation composition, and the visual relationships between landscape elements. Field observations further supported the evaluation by documenting design features, maintenance conditions, and patterns of space utilisation.

Data Collection

Data were collected through a structured questionnaire survey conducted in selected community green spaces across the three case study cities. A total of 406 valid questionnaires were obtained from residents who regularly use local green spaces. Respondents were selected using a convenience sampling approach in order to capture a diverse range of users across different age groups, occupations, and residential backgrounds.

The questionnaire consisted of three main sections (Table 1). The first section gathered socio-demographic information, including age, gender, education level, and length of residency. The second section focused on green space usage patterns, such as visitation frequency, duration of visits, and primary activities conducted in the green spaces. The third section examined perceptions of visual coherence and landscape quality, where respondents rated various aspects of the green space environment.

Table 1
Structure of Questionnaire Survey Instrument

Section	Component	Variables / Indicators	Measurement Scale
A	Demographics	Age, Gender, Education, Income, Length of Residence	Categorical
B	Green Space Problems	Greenery sufficiency, Distribution fairness, Maintenance condition, Cultural reflection	5-point Likert
C	Visual Coherence	Spatial organisation, Vegetation consistency, Integration with buildings, Cultural elements	5-point Likert
D	Perception–Attachment–Behaviour	Place attachment, Frequency of use, Emotional connection	5-point Likert
E	Design Preferences	Vegetation improvement, Cultural integration, Accessibility, Facilities	5-point Likert

To ensure reliability and clarity, the questionnaire was pre-tested with a small group of residents prior to the main survey. Feedback from the pilot survey was used to refine the wording and structure of the questions. Surveys were administered on-site in selected community green spaces during different times of the day and week to capture a representative range of users.

Data Analysis

The collected data were analysed using a combination of descriptive and inferential statistical techniques. First, descriptive statistics were used to summarise respondents'

demographic characteristics and general perceptions of community green spaces. Mean scores and standard deviations were calculated to identify the overall evaluation of visual coherence and landscape quality.

Second, factor analysis was employed to identify the key dimensions underlying residents' perceptions of visual coherence in green spaces. This analysis helped to group related landscape attributes into broader perceptual categories. Third, regression analysis was conducted to examine the relationships between visual coherence indicators and residents' satisfaction with green spaces. This allowed the study to determine which landscape factors most strongly influence user perceptions.

In addition to quantitative analysis, qualitative observations from field surveys and photographic assessments were used to interpret and contextualise the statistical findings. This triangulation of data sources helped improve the reliability and depth of the analysis.

Reliability and Validity

To ensure the reliability of the survey instrument, internal consistency tests were conducted using Cronbach's alpha (Table 2). A reliability coefficient greater than 0.70 was considered acceptable for the variables used in the analysis. Construct validity was assessed through factor analysis, ensuring that the questionnaire items effectively measured the intended perceptual dimensions of visual coherence.

Table 2
Reliability Analysis (Cronbach's Alpha)

Construct	Cronbach's Alpha
Visual Coherence	0.852 – 0.926
Overall Instrument	0.938

Furthermore, the use of multiple data sources—including surveys, visual assessments, and field observations—enhanced the validity of the research. By combining subjective perceptions with objective landscape evaluations, the study provides a comprehensive understanding of visual coherence in community green spaces within desert urban environments.

Results and Discussion

Socio-Demographic Characteristics of Respondents

A total of 406 valid questionnaires were collected from residents using community green spaces in Wuwei, Zhangye, and Jiayuguan. The demographic profile of respondents indicates a diverse sample representing different age groups, genders, and educational backgrounds. The proportion of male and female respondents was relatively balanced, ensuring that perceptions of green space quality were not biased toward a particular gender group.

In terms of age distribution, a large proportion of respondents were between 25 and 55 years old, reflecting the working-age population that frequently uses community green spaces for recreation and social interaction. Younger respondents often reported visiting

green spaces for leisure activities and physical exercise, while older residents primarily used these spaces for walking, relaxation, and social gatherings.

Regarding education levels, most respondents had completed secondary or tertiary education, suggesting that participants were generally capable of evaluating landscape quality and environmental conditions. The demographic diversity of respondents provides a reliable basis for analysing perceptions of visual coherence in community green spaces.

Patterns of Green Space Use

The survey results indicate that community green spaces play an important role in the daily lives of residents in the three case study cities (Table 3). A significant proportion of respondents reported visiting nearby green spaces several times per week, highlighting their importance as accessible recreational environments.

Table 3
Patterns of Green Space Use

Variable	Category	Observation
Visit Frequency	Several times/week	Majority usage pattern
Activities	Walking	Most common
	Relaxation	Very frequent
	Social interaction	Moderate
	Exercise	Moderate
	Family activities	Occasional

Walking and relaxation were identified as the most common activities in community green spaces, followed by social interaction, physical exercise, and accompanying children or elderly family members. These findings suggest that community green spaces function primarily as neighbourhood-level recreational and social spaces rather than specialised leisure destinations.

However, the frequency of green space use varied depending on the perceived quality of the landscape environment. Respondents who rated the visual organisation and maintenance of green spaces more positively were more likely to visit these spaces regularly. This finding suggests that the aesthetic and spatial quality of green spaces significantly influences residents' willingness to use them.

Residents' Perceptions of Visual Coherence

The survey results reveal that visual coherence is an important factor influencing residents' evaluations of community green spaces (Table 4). Respondents generally preferred landscapes that exhibited clear spatial organisation, consistent vegetation patterns, and visually harmonious design elements.

Table 4
Key Indicators of Visual Coherence

Dimension	Indicators
Vegetation	Arrangement, consistency, diversity, maintenance
Spatial Organisation	Layout clarity, pathways, zoning
Accessibility	Connectivity, proximity, barriers
Safety	Visibility, openness, user comfort
Integration	Harmony with surrounding buildings
Cultural Elements	Symbolism, identity features

Among the evaluated indicators, vegetation arrangement and spatial order received the highest importance ratings. Residents expressed a preference for green spaces where trees, shrubs, and lawns were arranged in structured and visually balanced patterns. Landscapes that appeared orderly and well-maintained were perceived as more comfortable and aesthetically pleasing.

Accessibility and safety were also strongly associated with perceptions of visual coherence. Green spaces with clear pathways, visible boundaries, and unobstructed sightlines were evaluated more positively by respondents. These features enhance the legibility of the environment, allowing users to easily understand the spatial structure of the landscape and navigate within it.

Conversely, green spaces that lacked visual organisation or contained poorly maintained vegetation were often perceived as unattractive and less inviting. Respondents indicated that disordered landscapes with inconsistent design elements reduced their enjoyment of the environment and discouraged prolonged use.

Key Factors Influencing Visual Coherence

Factor analysis identified several key dimensions that shape residents' perceptions of visual coherence in community green spaces (Table 5). These dimensions include vegetation quality, spatial organisation, accessibility, and maintenance condition.

Table 5
Residents' Evaluation of Visual Coherence

Indicator	Agreement (%)	Key Insight
Spatial Organisation	38% agree	Weak layout clarity
Vegetation Quality	35% agree	Poor maintenance & patchiness
Built Integration	41% agree	Moderate satisfaction
Cultural Identity	32% agree	Weak cultural expression

Vegetation quality emerged as one of the most significant factors influencing visual perception. Respondents preferred landscapes that contained diverse yet well-organised vegetation structures, including a combination of trees, shrubs, and ground cover. In desert cities, where vegetation resources are limited, the strategic arrangement of plant species plays an important role in enhancing visual diversity and ecological resilience.

Spatial organisation was another critical factor influencing landscape perception. Green spaces with clearly defined zones, structured pathways, and coherent spatial layouts were

perceived as more visually appealing and easier to use. Such spatial clarity helps reduce cognitive effort when interpreting the environment, which aligns with the environmental preference framework proposed by landscape perception research.

Maintenance conditions also significantly influenced perceptions of visual coherence. Well-maintained landscapes with clean pathways, healthy vegetation, and functional facilities contributed to positive evaluations of green space quality. Poor maintenance, on the other hand, often disrupts visual harmony and reduces the perceived value of the landscape.

Discussion

The findings of this study highlight the importance of visual coherence as a key determinant of residents' satisfaction with community green spaces in desert cities (Table 6). In arid environments such as the Hexi Corridor, where ecological constraints limit vegetation abundance, the visual organisation of landscape elements becomes particularly important for creating attractive and functional green spaces.

Table 6
Effects of Visual Coherence on Attachment and Behaviour

Dependent Variable	Independent Variable	β	t-value
Place Attachment	Visual Coherence	0.426***	8.214
	Spatial Legibility	0.281***	5.963
	Cultural Symbolism	0.217***	4.587
	Vegetation Quality	0.164***	3.442
Behavioural Use	Place Attachment	0.532***	10.11
	Visual Coherence	0.263***	5.731
	Cultural Symbolism	0.189***	3.862

Note: *** significant at 1% level.

The results indicate that residents value landscapes that exhibit clear spatial patterns, structured vegetation arrangements, and consistent design elements. These findings align with existing theories in environmental perception, which suggest that coherent environments are easier to interpret and therefore more aesthetically pleasing. Landscapes that provide visual clarity and spatial order allow users to feel more comfortable and confident in navigating the space.

Furthermore, the study demonstrates that visual coherence is closely linked to the usability of green spaces. Residents are more likely to visit and spend time in green spaces that appear organised, safe, and well-maintained. This relationship suggests that improving the visual quality of green spaces can indirectly promote more active use of urban public spaces.

In desert urban contexts, the design of visually coherent landscapes requires careful planning and management. Limited water resources and harsh climatic conditions restrict the range of vegetation that can be used in urban landscapes. Therefore, landscape designers must rely on strategic spatial composition, plant selection, and maintenance practices to create visually appealing environments.

Overall, the findings provide important insights for urban planners and landscape designers working in arid regions. By prioritising visual coherence in the planning and design of community green spaces, cities can enhance both the aesthetic quality and functional value of urban landscapes, ultimately contributing to improved urban liveability.

Conclusion and Implications

Conclusion

This study examined residents' perceptions of visual coherence in community green spaces within desert urban environments, focusing on three representative cities in the Hexi Corridor: Wuwei, Zhangye, and Jiayuguan. Using a mixed-methods approach that combined questionnaire surveys, visual assessments, and field observations, the research explored how residents evaluate the visual organisation and overall quality of neighbourhood green spaces.

The findings demonstrate that visual coherence plays a significant role in shaping residents' perceptions and use of community green spaces. Landscapes characterised by organised vegetation patterns, clear spatial structures, and consistent design elements were generally perceived as more attractive and comfortable. Among the evaluated factors, vegetation quality, spatial organisation, accessibility, and maintenance conditions emerged as the most influential determinants of visual coherence.

The results also reveal that visually coherent landscapes encourage more frequent use of community green spaces. Residents were more likely to visit and spend time in green spaces that appeared well-structured, safe, and aesthetically harmonious. Conversely, poorly maintained or visually disordered environments reduced users' satisfaction and willingness to engage in outdoor activities. These findings highlight the importance of considering both functional and perceptual qualities when designing urban green spaces, particularly in arid urban environments where ecological constraints limit landscape diversity.

Planning and Design Implications

The findings of this research provide several important implications for urban planners, landscape architects, and policymakers involved in the development of green spaces in desert cities.

First, urban green space planning should move beyond quantitative indicators such as green coverage ratios and emphasise the qualitative aspects of landscape design. Incorporating visual coherence into planning frameworks can significantly enhance the aesthetic and experiential quality of community green spaces.

Second, landscape design strategies should prioritise clear spatial organisation and structured vegetation arrangements. The use of layered vegetation structures, coherent planting patterns, and well-defined pathways can improve both the visual appeal and functional usability of green spaces.

Third, maintenance and management practices play a crucial role in preserving visual coherence. Regular maintenance of vegetation, pathways, and public facilities is essential to sustain landscape quality and ensure that green spaces remain attractive and safe for residents.

Fourth, in desert environments where vegetation resources are limited, designers should adopt context-sensitive planting strategies that maximise visual impact while minimising water consumption. The selection of drought-tolerant plant species and efficient irrigation systems can support sustainable green space development in arid regions.

Policy Implications

From a policy perspective, local governments should integrate landscape perception and visual quality indicators into urban green space evaluation systems. Current planning policies often emphasise the quantity of green space provision, but the findings of this study suggest that the perceived quality of green spaces is equally important for promoting their use and social benefits.

Urban development policies in desert regions should also encourage community participation in green space planning and management. Engaging residents in the design and evaluation process can help ensure that green spaces reflect local preferences and respond to the needs of neighbourhood users.

Limitations and Future Research

Despite its contributions, this study has several limitations. The research focused on three cities within the Hexi Corridor, which may limit the generalisability of the findings to other desert urban contexts. Future studies could expand the geographical scope to include additional arid cities in different regions.

Furthermore, this study primarily relied on residents' perceptions collected through questionnaire surveys. Future research could incorporate advanced spatial analysis methods, landscape metrics, or GIS-based evaluations to examine the relationship between physical landscape characteristics and perceived visual coherence.

Finally, additional studies could explore the relationship between visual coherence, place attachment, and behavioural use of green spaces, which would provide deeper insights into how landscape design influences residents' emotional connections to urban environments.

References

Appleton, J. (1975). Landscape evaluation: the theoretical vacuum. *Transactions of the Institute of British Geographers*, 120-123.

Cernicova-Buca, M., Gherheș, V., & Obrad, C. (2023). Residents' satisfaction with green spaces and daily life in small urban settings: Romanian perspectives. *Land*, *12*(3), 689.

Gülçin, D., & Yalçınkaya, N. M. (2024). Correlating fluency theory-based visual aesthetic liking of landscape with landscape types and features. *Geo-spatial Information Science*, *27*(1), 237-256.

Jain, A. (2025). Urban green spaces and their indispensable necessity in the context of cities experiencing rapid urbanisation in India: An analysis of current trends and future implications. *International Journal of Environmental Pollution and Environmental Modelling*, *8*(2), 122-134.

Kaplan, R., Kaplan, S., & Brown, T. (1989). Environmental preference: A comparison of four domains of predictors. *Environment and Behavior*, *21*(5), 509-530.

Kong, L., Liu, Z., Pan, X., Wang, Y., Guo, X., & Wu, J. (2022). How do different types and landscape attributes of urban parks affect visitors' positive emotions?. *Landscape and Urban Planning*, *226*, 104482.

Russo, A. (2024). Urban green spaces and healthy living: a landscape architecture perspective. *Urban Science*, *8*(4), 213.

Saeedi, I., Shayesteh, K., & Faraji, T. (2025). Urban green infrastructure and safety: examining the relative effects of socio-economic and environmental factors on perceived safety of users: I. Saeedi et al. *Security Journal*, *38*(1), 6.

Selanon, P., & Chuangchai, W. (2023). The importance of urban green spaces in enhancing holistic health and sustainable well-being for people with disabilities: A narrative review. *Buildings*, *13*(8), 2100.

Yin, Y., Shao, Y., Meng, Y., & Hao, Y. (2023). The effects of the natural visual-aural attributes of urban green spaces on human behavior and emotional response. *Frontiers in Psychology*, *14*, 1186806.