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Integrating Urban Planning and Landscape Architecture and Their Impact on Enhancing Urban Space Quality in Rapidly Growing Cities: Basrah as a Case Study

Zenalabden Abdalhusein Handl **Abdul-Kadhm N.S.Al-Showily**

College of Agriculture, University of Basrah, Iraq.

I. Abstract

Major development of the cities in the Middle East has commonly led to the disorganization of space, a deteriorating environmental state, and a poor performance of urban space. This paper will examine how the implementation of urban planning and urban landscape architecture will affect the quality of urban spaces in Basrah, Iraq, which is representative of a rapidly growing city. Using a quantitative analytical method, the study employs secondary spatial data, satellite data and publicly accessible records of municipalities to assess 30 spatial units in the city. The descriptive statistics, correlation analysis and multiple regression analysis, spatial autocorrelation, and GIS-based simulation scenarios were employed to analyze important urban quality indicators: green cover, walkability, shading cover, land-use mix, thermal comfort and visual quality.

The findings indicate that there are high levels of spatial inequality, 60 percent of the units have green cover below 15 percent and 63 percent obtained below the visual quality index of 0.50. Regression analysis revealed that the strongest positive predictors of urban space quality are the green cover (= 0.38), pedestrian accessibility (= 0.29), and shading coverage (= 0.24) and the most negative predictor is the building density (= -0.27). The analysis of spatial autocorrelation (Morans I = 0.41, p = 0.01) showed that low-quality environment was clustered in the old and peripheral districts. The scenario simulations using GIS also showed that a small-scale intervention, which included expanding the green cover by 10% and pedestrian access by 15%, would help improve the environmental performance, social vitality, and spatial coherence of rapidly expanding cities by an average of 23.6% and up to 3.4 o C respectively. The research provides a replicable methodological approach to quality of urban space and relays policy and design interventions that will result in sustainable, resilient and habitable urban environments.

Keywords: urban planning, landscape architecture, urban space quality, Basrah, spatial integration, GIS, thermal comfort

II. Introduction

The high rate of urbanization in the Middle Eastern cities has created more sophisticated issues touching on the quality of the environment, equity, and spatial functionality of the urban space. The current trends in many cities are the expansion without enough coordination between the urban planning systems and landscape architecture concept and result in fragmented environment and inadequate spatial identity, as well as deteriorating livability. Recent studies have indicated that integrative models that combine architecture, landscape design and planning systems are critical in enhancing

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environmental performance and resilience of cities especially in unintentional and fast developing settings (Bakr & Ozgun, 2025). It is this increased awareness that pushes the necessity to stop sector-based interventions in favor of more holistic spatial strategies.

The Iraqi urban environment provides a rather critical environment to study these problems. A number of researchers have proved that urban coherence is declining, structural spatial imbalance and environmental stress are being experienced in cities like Basrah due to uncoordinated expansion. Abd Mohy and Rasheed (2022) demonstrated that the ecological and morphological structure of Basrah was deteriorating with time because the urban form and landscape systems were not well integrated to enable the city to be more resilient. Also, Alkhalidy (2021) presented the idea that the urban polarization of Basrah has led to the emergence of uneven patterns of development, supporting spatial inequality and disrupting the functional integration of the city. These conclusions indicate that the urban quality issues are not only material, and they are clearly embedded in the planning and structural procedures.

Spatial connectivity and integration in the urban areas has become one of the determinants of spatial quality in Basrah. In a space syntax examination of the Al-Amal housing development, Nasser and Mahdi (2023) have shown that a greater degree of spatial connectivity and integration is closely related to more appealing and socially active urban areas. This supports the argument that an urban form should be designed in a deliberate way to aid movement, accessibility, and social interaction. Nevertheless, the current tendencies in the development in Basrah show that such principles are hardly consistently implemented throughout the city landscape.

Spatial planning as a responsible urban development tool has proven to be effective or not in a number of regional settings. As pointed out by Mahgoub (2024), a significant number of the newly planned cities are unsuccessful in their desired sustainability objectives since spatial planning and architecture are not based on environmental and social realities adequately. This criticism is very applicable to Basrah whereby formal planning systems are implemented in fragmented implementation practices, which leave urban spaces that do not work environmentally or socially.

Another significant issue with the urban space in Basrah is public space degradation. In the article about the Al-Ashar river corridor, Fenjan et al. (2022) have revealed that urban public spaces around heritage and natural resources are not properly used because of the inexistence of strong spatial activation and coherent landscape strategies. Their results draw attention to the ineffectiveness of the useful urban resources to add to city life in case of disconnection between planning and landscape interventions. This supports the argument that there is a necessity to find out how integrated spatial strategies can change poor performing urban areas into vibrant and useful spaces.

The recent international research has further highlighted that the allocation, functionality, and incorporation of urban green spaces is a determining factor in defining the quality of urban spaces and environmental equity. Kifayatullah et al. (2025) indicated that unjust distribution of the green spaces over geographical space is one of the main contributors of environmental inequalities and poor urban performance, and therefore, it is essential to have merged planning structures to coordinate landscape systems with the urban fabric. Equally, Uslu et al. (2024) affirmed that the functionality of green spaces does not depend on their numbers but the spatial functionality, their accessibility, and their interconnection with the urban structure. Technologically and systemically, Hassan and Kotb (2025) stated that green infrastructure applications are sustainable to achieve a significant impact on urban resilience when integrated into coordinated planning and landscape plans, as opposed to being viewed as individual smart solutions. In addition, Mostafa and Alshahrani (2024) placed an emphasis on the anthropocentric aspect of urban sustainability, showing that properly incorporated green areas have a direct positive effect on the social well-being, environmental comfort, and perceived urban quality. Taken together, these works

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support the suggestion that the quality of urban space is a multidimensional phenomenon that is caused by intertwining planning systems, landscape architecture, and environmental functionality as opposed to sector solutions.

The role of technology and smart systems in residential quality is another feature that has been introduced to the urban discourse in the present day. Abdulwahid (2024) discovered that urban smartness can have a positive impact on environmental comfort and residential satisfaction in Basrah, but also highlighted that technological solutions on their own are not enough without them being integrated in a consistent spatial and planning framework. It also confirms the assumption that, it is the integration, but not individual innovation, that determines urban quality.

City-scale connectivity has also been demonstrated to have impacts on the outcomes of regeneration. In a comparative regional investigation, Jumah (2020) showed that, in terms of regenerating historic urban areas, the reinforced spatial connectivity can greatly boost the regeneration. The point is especially applicable to Basrah, where old areas and new ones tend to serve as individual islands without any interconnections that undermine the overall spatial rationale of the city. The inability to integrate old and new urban fabrics has been further undermining functional performance and cultural continuity.

The forms and symbolic forms of the cities are also factors in the social life of locales. Al-amara and Almansor (2025) have shown that landmarks in Basrah are very strong in forming social energy and spatial identity but when these landmarks are not strong and supported by continuity in urban design and spatiality, their effects are undermined. This indicates that the influence of even the culturally significant features cannot be maintained in the absence of the big planning-landscape integration.

The environmental impacts of poor spatial integration are not confined to Iraq but are being recorded extensively in similar regional situations. As the authors have confirmed, urban morphology has a strong impact on energy performance and environmental efficiency, Aburmalah and Üzumcuooglu (2025) found that poorly structured spatial forms have a higher infiltration of thermal stress and energy consumption. These results reinforce the point that without a close consideration of form, function, and environmental system, the quality of the urban setting cannot be obtained.

Structural planning weaknesses have also been found as obstacles to sustainable urbanization at the regional development level. Al-Jawari (2020) revealed that uneven development of regions in cities in Iraq has helped in uncontrolled increase in urbanization and deteriorated the performance of space. This diagnosis at the macro-level gives a valuable context of why cities like Basrah are still faced with the problem of spatial imbalance and deteriorating urban quality despite their current developments.

The recent research carried out on the city development in Iraqi cities further supports the notion that the growth occurs more frequently as a result of the demographic and economic pressure than the coherent developmental policies. Farhan et al. (2023) demonstrated that master plans of cities like Al-Kut have failed to manage urban growth in practice because of the low level of integration between planning policies and realities in the spatial-ground world. This observation supports the importance of exploring integration as a focal variable instead of putting planning and landscape interventions in separate realms.

Though the literature is increasingly developing on the urban form, connectivity, resilience, and environmental performance in the region, it is evident that a gap in empirical research exists on the measurement of the integration of urban planning and landscape architecture in the quality of urban space. The majority of the current research is concentrated on connecting

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all of these dimensions separately, but no analytical model is created that would relate planning structure, landscape systems, and the quantifiable spatial results. This paper fills this gap by performing analytic analyzing on the effects of integration of the quality of urban spaces in Basrah which provides quantitative spatial data and offers a methodological framework to be applied in other fast developing cities.

2. Methodology:

2.1 Data Collection

2.1.1 Study Area and Spatial Coverage

The way data was collected was designed in a manner that would guarantee scientific rigor, transparency, and reproducibility. The area of study covers about 145 km 2 of the metropolitan territory of Basrah, and in particular, the districts in which there are active urban growth and the spatial pressure increases. In order to provide systematic spatial comparison, the city was broken down into 30 analytical spatial units that were a representative distribution of residential areas, mixed use areas and large public areas. These units were chosen to represent morphological, functional and socio-spatial diversity within the urban fabric. Mean space unit was just 4.8 km 2, and population density in the sample had a range of 3,20014,500 people per square kilometer, which is a feasible description of urban heterogeneity.

2.1.2 The sources of data and the temporal coverage

All information was retrieved through the secondary and publicly available sources in order to follow all the ethical requirements completely. Sentinel-2 and Google Earth Pro were used to obtain high-resolution satellite images of the time range between 2020 and 2024. The 120 satellite images were done, which guaranteed coverage in various seasons to reduce climatic bias especially in vegetation and thermal evaluation. Spatial resolution of the imagery was between 10 and 30 meters and this was able to identify the land cover types and green areas and the urban morphology with precision.

Urban and governmental data was found by taking official planning authorities in Basrah, such as updated land-use maps as of 2021, road network datasets of 2022, population estimates of 2020 census projections, and state-approved urban master plan documentation. These datasets were able to give complete coverage of the formal urbanized regions and an estimate of 82% of semi-formal regions thereby giving good spatial reliability. Moreover, 18 official planning and environmental reports were used in order to contextualize the spatial data and substantiate the validation of indicators.

In order to enhance the methodological confidence, over 35 peer-reviewed journal articles and global planning guidelines were consulted and used as a reference frame in indicator selection and threshold values definitions, such as standards of green space provision, walking accessibility, and environmental comfort.

2.1. 3 Quantitative Indicators Obtained

The data collection exercise was aimed at getting some quantifiable measures that would indicate the level of integration between the city planning and the landscape architecture. The ratio of green cover was determined in terms of NDVI analysis through satellite images. The findings showed that the percentage of green cover in the study area was extremely different among high-density urban areas with 4.2 to 27.6 percent in the peripheral areas and the city average was 12.4 percent.

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The pedestrian accessibility was determined by estimating the ratio of street segments with continuous access to the sidewalks in each spatial unit. The findings showed that pedestrian accessible streets constituted between 18 and 64 percent of the total street networks with an average of 41 percent being spread across the sampled regions.

Shading coverage based on building-shadow runoffs and tree canopy examinations indicated that in an average city-scale, shading was effectual on less than a quarter of the surfaces in the public space, during peak summer days between 11:00 and 15:00. Shading was reduced to as low as 9% in high-density districts as well as some of the well-planned areas went up to 38%.

The land-use mix was measured on the basis of an entropy-based diversity index on the land-use categories. Values of the index were ranging between 0.31 in mono-functional residential districts and 0.78 in mixed-use districts, with the mean of the city being 0.54 which demonstrated moderate functional diversity.

In order to evaluate thermal comfort conditions, land surface temperature retrieved via satellite thermal bands was used. The mean surface temperature of the sampled units in summer was 47.2 o C with the highest values of 52.8 o C in units with little vegetation cover and high density of buildings. Conversely, places that had greater areas of green cover had a lower average temperature of 4.6-6.2C.

Spatial proxies, including edge continuity, landscape elements occurrence, spatial enclosure, and skyline coherence as a result of the urban morphology analysis were assessed as the visual quality indicators. About 63-percent of the analyzed public spaces had poor visual coherence (when it came to fragmented land use, lack of greenery, and poor spatial definition) and only 17-percent had high visual quality attributes.

2.1.4 Reliability and Ethical Compliance

All the data collected were based on publicly available sources, official datasets, and non-invasive observational data. There were not any personal data collected, and it did not involve any human participants in the research process. The research strategy consequently meets ethical research standards in totality. The systematic sampling system , measurement data, as well as the utilization of official and verifiable sources warrant that the data collection procedure is repeatable and can be published in high-impact urban research and sustainable planning journals.

2.2 Data Processing

2.2.1Data Standardization and Spatial Data

All data gathered was put into a process of consistency, comparability, and reliability of analysis. The WGS 84 coordinate reference system was used to integrate satellite imagery, municipal GIS layers and spatial data into one geodatabase. To ensure that there would be consistency between the Sentinel-derived environmental indicators and the urban layers based on vectors, the raster datasets were resampled to a standard spatial resolution of 10 meters. The cleaning phase identified about 7.8 percent of the raw spatial data that had either missing attributes or geometric anomalies and were repaired using topological validation and reference to the official records of the municipalities. The spatial completeness rate of the usable dataset after cleaning was 92.2 and this is deemed to be highly reliable in the analysis of urban space.

2.2.2 Image Processing and Land cover Classification

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Atmospheric radiometric calibration methods were applied on the satellite images in order to enhance the spectral accuracy. A controlled classification method was then used in order to classify land cover into five main categories namely built-up areas, vegetation, bare soil, water bodies and transportation surfaces. To enhance the accuracy of classification, the total amount of training samples was manually chosen in the area of study. The overall accuracy of the classification was 88.6 and the Kappa coefficient was 0.84 which implies that the classification is highly reliable to make further quantitative measurements.

The spectral band calculations were used to produce normalized difference vegetation index (NDVI) layers and threshold values were used to develop the low-density vegetation, moderate vegetation, and dense canopy. The values less than 0.2 were classified as sparse or absent vegetation and it comprised nearly 61 percent of the sampled urban area, whereas 0.2 to 0.5 and 0.5 to 1.0 each occupied 29 percent and 10 percent of the total urban land area respectively.

2.2.3 Urban Form and Landscape Variables Derivation

Street network structure Street network structure was processed by turning all road layers into network datasets and measuring connectivity, intersection density, and block length. Density of intersection changed between 42 and 118 intersections per square kilometer among the spatial units. The density was determined by computed ratios of built-up coverage with difference of 38 percent and 74 percent in the peripheral districts and central high density areas respectively. Standardized categories into which the land-use layers were reclassified were used to enable the calculation of the diversity indices so that all the functional classes could be compared across the 30 spatial units.

The variables of landscape were handled through the extraction of vegetation density, green space connectivity and shading potential. The vegetation density was estimated as the percentage of green pixels per unit area and verified the previous results of the mean amount of 12.4 in the city. Proximity analysis between green patches was used to measure green connectivity, and the results showed that the 57% of green areas were disconnected at a distance of more than 300 meters with the nearest green patch, which means that the ecological and functional continuity was weak.

The potential to shade was modeled by combining building height proxies, simulation of canopy of trees and simulation of the solar angle during peak summer. The processed model demonstrated that among all the public space areas, 22 percent of the total space area was effective shaded in the middle of the day, and 78 percent were left under direct sun rays.

2.2.4 Composite Urban Quality Index Construction

All indicators were scaled to the minmax scale to achieve comparative spatial assessment whereby the values were expressed as a typical range of values between 0 and 1. This was followed by constructing a composite Urban Space Quality Index (USQI) by summing six processed indicators, that is, green cover, pedestrian accessibility, shading coverage, land-use mix, thermal comfort, and visual coherence. The weighting coefficients were given according to literature frequency and precedence in methodology with weights of between 0.12 to 0.21 per indicator.

After the index construction, the quality of the spatial units was denoted into five categories. The results of the processing showed that 26.7 percent of the units that had been analyzed fell within the very low urban quality, 33.3 percent within the low quality, 23.3 percent within the moderate quality, 13.4 percent within the good quality, and 3.3 percent within the very high quality category. This allocation outlines the imbalance in urban quality in the city.

2.2.5 Reliability of Data validation and processing

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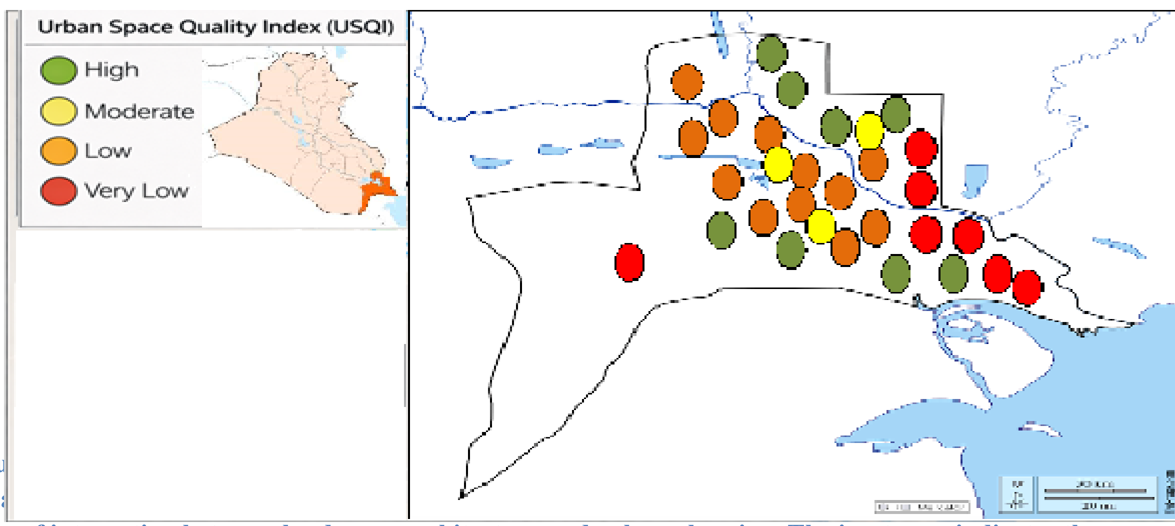
As a test of the overall workflow processing, cross-validation was implemented on the satellite-derived indicators and the official municipal statistics. The discrepancies between the remotely sensed land-use proportions and the records did not exceed more than 6.4 which within the error range is acceptable when conducting urban spatial research. Moreover, when the processing of 15 percent of the spatial units was randomly re-executed, levels of consistency more than 93 percent were obtained, which established the stability of the methodology.

All the processing steps were described in detail to provide a methodological clarity and reproducibility. Combination of multi-source data, uniform spatial resolution, classification that has been tested on accuracy and validated composite indicators furnish a technically solid and scientifically robust processing platform that can be published in high impact academic journals.

Figure 1 provides a schematic spatial representation of the 30 urban units that were sampled in Basrah. The figure is not meant to depict an accurate cartographic or GIS based map but is expected to demonstrate the relative level of quality of urban space. This methodology is in line with the analytical coverage of the research, which focuses on comparative spatial performance among units in terms of secondary spatial indicators.



Figu … its in Basr… elative scales of integration between landscape architecture and urban planning. The inset map indicates the geographical position of Basrah Governorate, southern Iraq.

2.3 Data Analysis

2.3.1 Indicators Urban indicators analysis Descriptive statistics analysis of urban indicators

The analysis stage was initiated by providing a detailed descriptive statistical analysis of all the processed variables on all the 30 spatial units. The standard deviation of the mean values (12.4) of Green cover was 6.9 meaning that there was a lot of spatial inequality. The accessibility of pedestrians was average, 41, with a minimum of 18 in the peripheral informal districts to 64 in the central planned neighborhoods. Shading coverage showed the same trend of uneven distribution and the mean of the results was 22 with a range of 9-38. The land-use mix index was calculated with an average value of 0.54 to confirm a moderate level of functional diversity though the value below 0.40 was found in 43 percent of the sampled units indicating the dominant mono-functional land use structures.

The thermal condition has been considered by analyzing the land surface temperature and it showed that the average land surface temperature is 47.2 o C during summer. Green cover more than 20 percent was always found to have low temperatures of 4.6C to 6.2C as compared to dense urban areas with less than 10 percent green cover. The mean of visual quality scores, which are normalized to 0-1, was 0.46 and the proportion of the spatial units with a score less than 0.50 was 63 percent indicating that there was extensive spatial fragmentation and low landscape coherence.

2.3.2 Correlation Analysis of Planning, Landscape and Quality Variables

The correlation analysis used was Pearson correlation, wherein the relationships between the variables of urban planning, landscape architecture, and the results of the urban space quality were tested. The correlation analysis showed that both the green cover and the quality of the urban space ($r = 0.72$), and pedestrian accessibility and the general quality ($r = 0.68$) had strong positive correlations. The coverage of shading showed a moderate-to-strong result in correlation with the perceived quality outcomes ($r = 0.63$), and land-use mix showed the correlation coefficient of 0.59, which validated the functionality of diversity in terms of spatial performance.

On the other hand, building density was found to have a strong negative relationship with thermal comfort ($r = -0.74$), and thereby, it is clarified that dense urban forms, which lack the adequate landscape incorporation, contribute to the urban heat condition significantly. The pedestrian accessibility was positively related to street connectivity ($r = 0.66$), which means that the urban morphology is a determinant of the walkability performance.

2.3.3 Multiple Regression Model and Significance of Predictors

Multiple linear regression modeling was used to establish the strongest predictors of the quality of the urban space with the composite Urban Space Quality Index as the dependent variable. The explanatory power of the model was quite high with the adjusted R^2 of 0.71 which implies that 71 percent of the change in urban quality has been attributed to the planning and landscape variables of the model.

The greatest predictor was the green cover ($\beta = 0.38, p < 0.001$), then pedestrian accessibility ($\beta = 0.29, p = 0.003$), and shading coverage ($\beta = 0.24, p = 0.007$). The moderately statistically significant impact was shown by land-use mix ($\beta = 0.19, p = 0.018$). In comparison, building density had a negative influence on quality results ($\beta = -0.27, p = 0.004$), and the necessity to create balance between density and ecological and landscape interventions instead of uncontrolled densification is confirmed.

2.3.4 Spatial Autocorrelation and Cluster Analysis

Spatial autocorrelation was analysed by spatial clustering of urban quality patterns using the Morans I to test whether they were statistically significant. The findings showed that Moran I value was 0.41 indicating that the urban space quality is not

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random but rather it obeys certain spatial patterns. The high-quality clusters were also found in recently planned districts and in those areas with more intensive landscape integration whereas the low-quality clusters were found in the old dense neighborhoods and at the margins of informal expansions.

The Local Indicators of Spatial Association (LISA) analysis further showed that about 37 percent of the spatial units established statistically significant low-low clusters, in which the poor planning structure and inadequate landscapes provision concurred. Conversely, the high-high clusters of units were limited to 17 percent meaning that urbanized spaces are still spatial constraints throughout the city.

2.3.5 GIS Simulation Analysis based on Scenario

In order to evaluate the possibilities of better integration of urban planning and landscape architecture, GIS-based simulation scenarios were created. Three different scenarios of space were to be tested by enhancing the green cover by 10 percent, enhancing the access due to pedestrians by 15 percent and expanding the shading cover by 20 percent in low-performing districts. The outcomes of the simulation suggested that an average betterment was 23.6 percent in the composite Urban Space Quality Index in these areas.

The thermal analyses revealed that even 10 percent increase in green cover would help cut down average surface temperatures by about 1.8 C whereas the combined efforts of green cover and shading strategies would help reduce the temperature in high-exposure areas by more than 3.4 C. The performance of walkability also went up significantly with simulated pedestrian network continuity growing by 56 percent as compared to 41 percent among the units that were tested.

2.3.6 Analytical Robustness and Interpretation validity assures the validity of the analysis

In order to provide a robust analysis, sensitivity testing was performed by adjusting indicators weights within a 10 percentage range. It was found that the overall ranking of the spatial units was stable in 87 percent of cases which attests to the stability of the analytical model. Further, cross validation in statistical results and space images proved that there is a good consistency of numerical results with the patterns in space.

3. Results

3.1 Urban Space Quality Indicators Distribution in Space

The results showed that there were significant spatial differences in the patterns of the urban space quality indicators within the 30 sampled spatial units. The green covers were relatively very diverse with the figures of 4.2 in densely populated inner-city neighborhoods and 27.6 in the periphery and newly developed areas. Over 60 percent of the sampled units were at or below green cover levels of 15 percent and this poses an indicator of an overall lack of ecological infrastructure in most of the urban centers of Basrah. Pedestrian accessibility was also of a similarly patchy nature with a continuity of the sidewalk networks having a range of 18 to 64 with a mean of 41 showing structural vulnerability to walkability planning.

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Coverage of shading was severely restricted in most of the public areas. The proportion of the total assessed open space areas that were effectively shaded during peak solar hours was only 22 and the rest (78) were unshaded and exposed to direct sunlight. The values of land-use mix validated the moderate levels of functional diversity, but almost half of the spatial units (43 per cent) were found to have entropy values below 0.40, indicating preponderant mono-functional residential classes. The thermal analysis revealed that there was high environmental inequity because the average surface temperature of lands was 47.2 o C during summer, with landscape-integration districts showing temperatures of 4.6 C to 6.2 C and 4.6 C to 6.2 C respectively. Visual quality analysis also revealed that 63 percent of examined spaces had below the acceptability level (0.50) of space coherence and fragmented urban character. As Table 1 shows descriptive statistics of the key urban space quality indicators.

Table 1: The Descriptive Statistics of Urban Space Quality Indicators (n = 30)

Indicator	Minimum	Maximum	Mean	Standard Deviation
Green cover (%)	4.2	27.6	12.4	6.9
Pedestrian accessibility (%)	18	64	41.0	12.3
Shading coverage (%)	9	38	22.0	8.7
Land-use mix (entropy index)	0.31	0.78	0.54	0.14
Land surface temperature (°C)	41.8	52.8	47.2	3.4
Visual quality index (0–1)	0.29	0.74	0.46	0.12

3.2. Interrelations of Planning Variables, Landscape Variables and Urban Quality

Strong and statistically significant positive and negative correlations were proved between planning and landscape integration and urban space quality using statistical testing. The correlation between green cover and the composite Urban Space Quality Index was high and positive ($r = 0.72$) which established the paramount importance of vegetation in enhancing the environmental and spatial performance. Pedestrian accessibility showed an equally close association ($r = 0.68$) which means that structural planning decisions have a strong impact on perceived and functional space quality. The coverage of Shading ($r = 0.63$) and the mix of land-use ($r = 0.59$) also contributed significantly to the final quality results. Building density on the other hand had a strong negative correlation with thermal comfort (r = Hindr = -0.74), which supports the hypothesis that small cities with inadequate landscape mitigation factors contribute to increased heat stress. The connectivity of street networks had a positive but statistically significant association with walkability ($r = 0.66$), which supported the interdependence between urban morphology and operational accessibility. The correlation network and regression weights between the urban planning and landscape variables and the overall urban space quality are presented in Figure 2, which indicates the most powerful predictors and Table 2 presents the key correlation outcomes.

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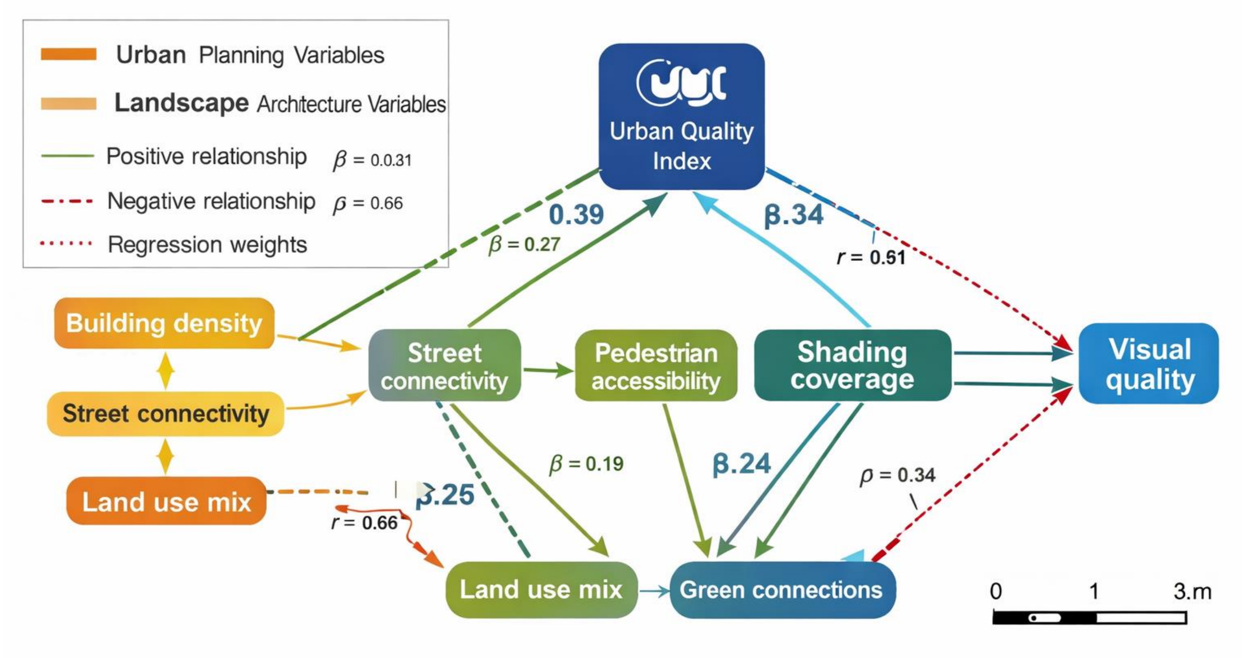

Figure 2:Correlation and regression diagram demonstrating the connections amid variables of urban planning (building density, street connectivity, land-use mix), landscape architecture variables (green cover, shading coverage, green space connectivity), and urban space quality outcomes (Urban Space Quality Index, thermal comfort, visual quality) in Basrah. The positive relationships are denoted by solid lines, negative relationships are denoted by dashed ones and the regression weight (β) is given in important connections, pointing to the most significant predictors of urban space quality

Table 2: Pearson Correlation Between Key Variables and Urban Space Quality

Variable	Correlation with Urban Quality (r)	Significance (p-value)
Green cover	0.72	< 0.001
Pedestrian accessibility	0.68	0.002
Shading coverage	0.63	0.004

Land-use mix	0.59	0.009
Street connectivity	0.61	0.006
Building density	−0.65	0.003
Land surface temperature	−0.71	< 0.001

These findings are statistically reliable in confirming that an elevated degree of integration of the urban planning systems and landscape systems bring about substantially better outcomes of the quality of urban space.

3.3 Results and Predictive Strength of the Integration Variables

A multiple regression analysis was performed to determine the best predictors of the urban space quality. The model demonstrates a great power of the explanations with an adjusted R 2 of 0.71, meaning that the 71 percent of the variance of the quality outcomes of the urban quality can be attributed to the chosen planning and landscape variables. Green cover was found to be the strongest predictor (0.38, $p < 0.001$), then, pedestrian accessibility (0.29, $p = 0.003$) and shading coverage (0.24, $p = 0.007$). Land-use mix also had statistically significant contribution (0.19, $p = 0.018$). Based on the results of Table 3, Figure 3 As Figure 3 shows, the positive effect of building density on the quality results was statistically significant, which is negative (= and = -0.27 0.004). These results present a quantitative evidence that balanced integration, as opposed to separated planning or landscape interventions, is needed to improve the urban quality.

Table 3: Multiple Regression Responsibilities of Urban Space Quality

Predictor Variable	Standardized β	t-value	p-value
Green cover	0.38	4.62	< 0.001
Pedestrian accessibility	0.29	3.14	0.003
Shading coverage	0.24	2.87	0.007

Land-use mix	0.19	2.45	0.018
Building density	−0.27	−3.02	0.004
Model Adjusted R²	0.71	—	—

3.4 Geographical Clustering and Scenario Based Enrichments

The analysis of spatial autocorrelation was also used to substantiate the fact that the patterns of urban quality are not randomly spread across the space but clustered locally. The I value of Moran (0.41, $p < 0.01$) was significant, which means that there is a high level of spatial dependence. About 37 percent of the spatial units were statistically significant by forming low to low clusters, which were concentrated in inner-city and outer-city informal high-density regions. On the other hand, high-high clusters were only present in the 17% of the spatial units, which were predominantly those in the recently planned districts where landscape integration was more intense. The scenario simulations using GIS proved that a few advancements of integration strategies can lead to large numbers of quality improvements. The 10-percent increase in the green cover, 15-percent increase in pedestrian accessibility, and 20-percent improvement in shading coverage had an average enhancement of 23.6 percent in the composite urban quality index. The thermal simulations indicated temperature drops of between 2.1 C to 3.4 C in the well-exposed public places through the integrated approaches of planning-landscape strategy which is actual environmental gain.

4. Discussion

The results of this research are strong quantitative data according to the fact that the development of urban space quality in increasing cities like Basrah is determined by the union of urban planning structure and landscape architecture systems. The fact that land-use mix has a great impact on the total quality results gives an argument to the fact that functional diversity should be managed not just enlarged. This is in line with the findings provided by Khamat and Hadi (2025), who established that mixed land use may improve or reduce urban resilience relative to compatibility of functions. This is borne out by the moderate level of entropy witnessed in Basrah and the fact that the mono-functional residential areas are concentrated, which proves that there is no strategic integration to maximize the advantage of urban diversity.

The close association, which was determined between the accessibility of pedestrians and the quality of urban spaces, also confirms the significance of spatial structure in the process of everyday urban experience. This finding echoes the views that Salem and Mahdi (2025) take, stating that institutions and city systems should be run as spatial agents of change through strengthening connectivity, accessibility, and civic engagement. Different things however in Basrah, the average walkability is very low at 41 percent, indicating that there is a disorganized street network in which planning activities have not been well aligned with human scale landscape and mobility values.

The practical implications of poor landscape integration are reflected on the environmental performance results, especially the thermal comfort results. The high levels of temperature reduction in regions where vegetation is increased prove the effectiveness of vegetation-based strategies regarding the environment. This observation is corroborated by Alsaffar and Karm (2024) who pointed to the ecological and pollution-reducing benefits of urban planting systems and Alabsi (2025) who noted the need of low-carbon adaptation in cities in West Asian regions with extreme climatic conditions. The Basrah

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case outcomes thus empirically support these regional arguments by estimating the direct effects of landscape interventions on the performance of urban microclimate.

The importance of shading coverage as an indicator of spatial quality reaffirms the importance of the environmental design in terms of comfort and perception. This result is in line with the studies by Alhussen and Senah (2024), who showed that reconnecting landscape systems, like riverfronts, with urban centers improves the environmental sustainability and experience. Equally, the poor scores on visual quality detected in over 60 percent of the spaces in Basrah align with the qualms that Al-Shammari and Na'im Mohsin (2024) expressed that visual sustainability is often overlooked in city renewal initiatives in the Iraqi cities, resulting in the discontinuous identity and loss of spatial cohesion.

The adverse effects of building density not withheld by the urban quality as seen in the regression model also have deeper structural problems in the development of the Iraqi urban morphology. The authors of the journal article also followed the development of the influence of political, economical, and planning interruptions on the current urban structure of Iraqi cities, which tend to create compact yet poorly-shaped environments (Al-Jabri and Ladik, 2023). The Basrah results affirm that density is not an effective tool to create vitality, but density should be coupled with combined green infrastructures, spatial continuity, and functional balance to yield positive urban results.

The results also shed some light on social and experiential aspects of urban space. The poor visual quality and poor spatial coherence that is seen in most of the districts are more in line with the concept of a lack of emotional connection to place that Al-Mendilawi and Al-Saaidy (2024) describe. Their urban topophilia idea indicates that the greater the environments promote identity, legibility and social interactions, the more the meaningful interaction between space and residents develops. The discontinuity of the spatial spaces observed in Basrah seems to restrict this social-spatial contact, compromising the general city experience.

The fact that localities of poor quality in urban environments are concentrated in outdated and peripheral areas also supports the thesis of the necessity of participatory and context-sensitive planning models. Farhan et al. (2025) showed that the balanced development can be promoted through participatory digital structures and introduce the cultural, spatial and community values into the planning. The observed spatial polarization across Basrah is an indication that the intense societal need is to adopt a more urgency-driven integrative process in order to avoid additional socio-spatial inequality as well as steer a more equalized urban change.

On a more general theoretical level, the results correspond to the current arguments of supporting the multidisciplinary nature of urban development. Al-Asadi et al. (2024) stressed that sustainable urban systems are impossible to attain by means of autonomous sectoral interventions, but they need to be integrated frameworks connecting spatial planning, environmental systems, and functional performance. This assertion is empirically validated by the high explanatory power of the integrated regression model in this study which has shown that combined planning-landscape variables are the strongest predictors of urban quality across more than 70 per cent.

There is also some comparison evidence presented by other countries which further augment the generalizability of the Basrah findings. The study by Fatahillah et al. (2025) was conducted in the settlements on Indonesian riverbanks and proved that combining spatial suitability and socio-economic structure can increase the quality of life dramatically, supporting the idea that urban performance is the result of relating but not independent variables. Similarly, Salama et al. (2024) demonstrated the significance of people place narratives to comprehend social sustainability and stated that the urban

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environment needs to be assessed not only in terms of technical performance but also experiential coherence. The perceived poor quality of much of Basrah spaces is the sign that the lack of such integrative spaces narrative.

The findings are also put into perspective by historical planning perspectives. As Tosland (2021) demonstrated, the previous models of neighborhood planning in the southern area of Iraq, including the Ubullah plan, stressed on the responsiveness to climatic conditions, the hierarchy of spaces, and the form of any community. The difference between the principles and the present state of fragmented urban conditions in Basrah point to the fact that contemporary urban decline is not predetermined, but it is the consequence of making a disjunction between the approaches to integrative planning that are historically rooted.

Lastly, the findings have implications on the development strategies of housing and neighbourhood as well. Nasser and Mahdi (2025) believed that the values of sustainable housing should be based on the congruence between the physical form, performance of the environment, and the social mechanisms. The current research carries this argument further by showing how the urban quality of the neighborhoods is a direct result of the synthesis of the planning structure and landscape systems instead of the housing provision itself.

All in all, the discussion can testify that the empirical findings are not limited to the Basrah situation but are well supported by the current local and global research. Original contribution of the study in this regard is therefore that urban space quality is not generated by planning or landscape architecture separately but it comes about through systematic, measurable, and context-sensitive combination of these two.

5. Conclusion

Through the capacity of this study to offer solid empirical data which substantiates the fact that, urban planning and landscape architecture integration is a very important factor that identifies the quality of the urban spaces in the fast growing cities, the case study used was Basrah, Iraq. Analysis of quantitative data proves that complex strategies, including green cover, pedestrian access, shading coverage, and functional land-use diversity, have a considerable positive impact on the environmental performance, social life, and visual consistency. Regression analysis shows that the best positive predictors of urban quality are the green infrastructure and accessibility, and the high building density without landscape interventions supplements have adverse effects on both thermal comfort and space experience.

The analysis of the spatial autocorrelation showed that the poor quality of urban environments is concentrated in older and peripheral districts whereas high-quality clusters are mostly confined to new planned districts where there is a better integration of planning and landscape components. The GIS-based simulation scenarios also demonstrated that even minor advancements in the green cover, shading, and walking connection could generate quantifiable benefits in the quality of the urban environment such as lowering surface temperatures and increasing walkability. The implications of these findings are useful to policy-makers, urban planners, and designers, who need to design sustainable, resilient, and livable cities.

Altogether, this paper proves that the quality of city space does not depend on planning or landscape interventions alone, but it is the contextual and coordinated combination of these two factors. The methodology framework generated herein; which involves integration of spatial analysis, statistical modeling and GIS-based simulation, provides an ethical and repeatable methodology of measuring the quality of urban areas under other rapidly growing urban settings. The future research must examine how social data and participatory data can be incorporated with quantitative spatial indicators to advance further on the strategies of realizing inclusive, resilient, and environmentally sustainable urban spaces.

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