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Investment Residential Towers and the Transformations of the Identity of Arab Cities: A Case Study of Baghdad

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ABSTRACT

This study explores the use of investment residential towers to change the urban identity of Arab cities and uses Baghdad as a case study. This study employs a sequential mixed-method research design that incorporates a household survey of 384 residents, semi-structured interviews (30), and visual-morphological analysis of 12 tower projects in Karkh and Rusafa. Descriptive statistics, chi-square tests, one-way Analysis of Variance (ANOVA), and multiple regression were used to analyze the survey data, whereas thematic, content, and visual–morphological analyses were applied to the qualitative and visual material. The results show significant perceived losses of privacy, diminishing place attachment, and disintegration of Baghdad's visual memory at the location of the new high-rise enclave. At the end of the paper, there are context-specific planning and design principles that aim to find a compromise between the establishment of vertical growth that is investment-led and the preservation of the sociocultural identity and historic urban environment of Baghdad.

1. INTRODUCTION

This study focuses on the transformation of the identity of Arab cities, in particular Baghdad, due to investment-driven residential towers.

The rapid development of residential towers in Baghdad is part of a more general trend in Arab capitals. These cities tend to place more emphasis on modern urban living than on preserving visual culture and identity. Investment-oriented projects can jeopardize the special character of Baghdad and, therefore, raise the status of new residents in the country.

This study aims to investigate and compare the implications of investing in residential towers for changing the urban identity of Arab cities, while also shedding light on contemporary processes and their impacts on visual memory, cultural legacies, and social relations, using Baghdad as a model.

While a number of studies have been carried out regarding the investments of high-rise residential buildings in Arab cities, most of them have focused on general indicators of sustainability, marketing and regulation without providing local guidelines for socio-cultural practices in Baghdad.

The present study applies a mixed method approach including a visual assessment, household survey and qualitative interviews in Baghdad to fill this gap. To support this finding, this paper recommends indicators and guidelines for policy in culturally sensitive investments in residential towers in Baghdad and other Arabic cities based on their local needs.

This study addresses this gap through a mixed-method approach that includes a visual assessment, a household survey, and qualitative interviews to understand how investments in residential towers transform the urban identity of Baghdad. Based on these results, this paper suggests a list of locally specific indicators and policy guidelines that can be used to inform culturally sensitive investments in residential towers in Baghdad and similar Arab cities.

This study examines the wider metropolitan area of Baghdad, with 12 investment nodes in Karkh and Rusafa as the centers of attention. These sites were chosen to epitomize systemic change in Baghdad's architectural identity and the ensuing sociocultural erosion.

The hypothesis states that the functions of the towers are the stimulating factors for identity change in Baghdad. The appearance of residential towers as an investment is a new phenomenon in the landscapes of Arab cities.

Accordingly, this study addresses the following research questions: RQ1: How do residential investment towers affect residents' perceptions of urban identity, visual memory, and privacy in Baghdad? RQ2: To what extent do these towers reshape the spatial and sociocultural structures of Baghdad's traditional neighborhoods? RQ3: Which locally grounded planning and design indicators can guide culturally sensitive investments in residential towers in Arab cities?

The main contribution of this study is threefold. First, it incorporates residents' perceptions and visual memory into the discussion on investment housing in Baghdad, an area that has been mostly under-researched in the past. Second, it defines urban identity based on an integrated combination of quantitative, qualitative, and visual measures specific to the

settings of Baghdad. Third, it suggests a locally specific policy and design guideline framework that can be used to shape high-rise investments culturally in Baghdad and other similar Arab cities.

2. LITERATURE REVIEW

Elkadi et al. [1] focused on the dual function of the tall building in the Arab cities, the balancing of the modernization and the preservation of cultural identity in Baghdad. The research focused on monitoring the visual impact in architectural design rather than studying specific cases of residential towers with qualitative analysis and the strategic framework of design in terms of literature review and design guidelines. It provides a framework for incorporating traditional elements with contemporary structures, creating a balance for future high-rise structures.

Cina [2] concerned with the preservation of architectural heritage in the face of urban redevelopment, in particular the conflict between demolition and preservation. Focuses more on the rehabilitation of historic centres and balance with religious/social identity Less emphasis on tall residential buildings. Case study analysis of conservation projects: project assessments and critical evaluation. The socio-cultural impacts of urban redevelopment projects are highlighted in this study, emphasizing the risks associated with homogenization and the loss of historical authenticity.

In a comparative context, Al Kassim [3] explored how iconic tall buildings influence identity and placemaking in the Baghdad's urban transformation. A comparative study on Dubai, which has a different sociopolitical and economic context than Baghdad. Comparative Use of Case Study Methodology for Two Iconic Buildings. This study enriches the knowledge of architectural landmarks as cultural signifiers that impact Indigenous identity and city reputation.

Alwehab and Al Ani [4] underlined the combination of the modern city planning and the past, but especially, the transit-oriented development (TOD). The planning of urban planning has expanded to incorporate transit infrastructure, in contrast to the effects of residential towers. The author performed a policy analysis and developed a strategic urban planning framework, as well as assessed TOD. The author suggested TOD as a viable approach to urban development that can be implemented to deal with modernisation and the preservation of culture in Baghdad.

Finally, Alsadoon [5] explored socio-economic changes that influenced architecture and city shape that reflected anxieties over the restructuring of social places. Includes decades-long analysis, which focuses on urban form and the issue of privacy not only in residential towers. Archival research, sociological and architectural analysis, historical review. Another social layer to the urban transformation the book provides is the need to have sustainable residential designs that are human oriented and that do not harm the heritage. Building on Alsadoon's [5] historical analysis of Baghdad's urban transformation, this study argues that contemporary residential investment towers in Baghdad are architectural dialogue that carry a peculiar language of the new architecture characterized by an innovative external form, site and functional distribution; as well as using different forms of geometry and modern materials; in residential tower projects has long been a preferred approach to promoting social and economic regeneration for many cities. A wave of globalization, the growth of the national economy, and the desire to attract foreign capital have resulted in thousands of such towers [6]. The Arab world has witnessed an increasing number of these towers since the 1950s. After 2003, a large number of investment residential towers were constructed in various parts of Baghdad. It is therefore pertinent to assess their impact on the socio-cultural identity of the city.

The necessity of educational and legislative measures that should defend the architectural heritage and the necessity to combine the modern urban needs with the traditional social and environmental elements are supported by literature.

The local knowledge and reporting of architectural identity do not exist, a gap that your study may fill with the provision of certain guidelines of culturally sensitive investment in residential towers.

2.1 The historical context and visual identity of Baghdad

Being one of the key cultural and political hubs in Mesopotamia and the Arab world, Baghdad has formed its urban structure through the strata of historical events and conflicts. The recent studies emphasize the importance of balancing the new development with the maintenance of historic areas, social life and privacy in such a way that the modernization process does not damage the unique visual character of Baghdad; its urban design and layout are the narrations of the ancient history that was influenced by ancient civilizations, invasions, and modern wars [7-9].

The character of the city is somewhat determined by its eccentric structure and historical connection; however, the legendary status of the city is suffered by modernization and several waves of development, especially after US-led invasion in 2003 [10].

Recent urban planning research highlights the need to combine modern development with preservation of historic areas, including those of old city walls and gates and narrow alleys, and the desire to achieve integration rather than antagonism between old and new urban districts [11-13].

Socioeconomic change, migration, and the oil boom of the 70s changed the organic, pedestrian-based architecture of Baghdad into a geometric and vehicular city. Affect the social space and privacy [14, 15].

What will be needed to maintain the visual identity of Baghdad is the acknowledgment of its historical significance and that future urban development of the city should maintain its unique character while serving the needs of modern society [16].

2.2 Investment in residential towers

Nevertheless, residential tower investment is also associated with serious challenges. They may ease a housing crunch, as well as attract local and international investment, but often these towers are not architecturally or functionally related to what has been the background of the traditional urban way of life. Their size and modernity might not be in harmony with history and the existing urban fabric, they also destroy the unique identity and the memory of cities like Baghdad. All this is manifesting especially acutely in situations where towers are constructed not only within but also next to the established heritage districts and tend to overwhelm and compromise the current urban structure [17].

As in most cities, Baghdad, formerly an urban centre, was a fortified, organically developed settlement that generated a

rich society, appealing to the individual, and was a city as we know it. The removal of barriers and the use of gardens and suburbs facilitated the growth of cities and the creation of new forms of buildings, such as skyscrapers. These have been enhanced by the dynamics of globalization to such an extent that multinationals in destination architecture have the capability of locating and investing in iconic buildings without necessarily knowing the cultural undertones of the situation at issue [18, 19].

As illustrated by lightning rod cities such as Dubai, the development of the waterfront and skyline by high-profile investors can change and enhance the global image of a city, on the one hand, but can also endanger to erase its layers of history and its richness of cultures, on the other. This phenomenon in Baghdad resembles investment towers as objects of economic potential and modernization, and the possible destruction of the social fabric and preservation of heritage [20].

To balance investment and identity in this manner, urban policies will be required to support the discrimination of tower locations (such as in the individual complexes of residential buildings rather than sensitive historic areas), association with transportation infrastructures, and protection of heritage. Simultaneously, community involvement and situational design play a crucial role in ensuring that the new development enhances rather than deteriorates the cultural and social life of the city [21].

Meanwhile, international discourse and discussions on sustainable high-rise development highlight that tall structures can play a positive role in city resilience, provided they are context-sensitive and built within a robust planning system [22].

2.3 Comparative analysis with other Arab cities

A series of joint indicators reinforces this trend. The first is the social status offered by investments in residential buildings. The second relates to the common economic circumstances of local investors in Arab capitals. The third indicator is the transformation of the residents of these buildings into the middle or upper-middle class.

2.3.1 Cairo

Cairo encompasses the vast area that surrounds the edifices of the Tahrir region, including apartments and similar residences that tower in the sky. It is a large investment hub that is flooded with bid value, construction, and luxury, with the predominant activity of the majority of inhabitants being property trading. Cairo is a group of symbols and rituals for investing wealth, such as the process of assigning numbers and calculating profits and losses, all predicated on properties of many sizes and ratios that have transformed the city of Cairo into a large housing market [23].

In Figure 1, the towers of a modern city, Cairo, are observed, and modern high-rise residential and hotel buildings are located in close visual contact with historic buildings along the Nile. This creates a contrast, disjointed skyline where new vertical elements do not have a coherent composition pulse, reflecting the lack of control in design and the contradictions between densification as fast as possible and conserving the historic image of the city.

2.3.2 Dubai

The identity of investment residential towers in Arab cities can be examined through a study of its architecture and urban design. Dubai's investment residential towers and the transformations of the city's identity as an international tourist city, business center and investment zone can also be revealed [24].

Faced with the failure of the city's specialization in re-exporting, local and international investment capability, and the exploitation of Dubai's ability, natural environment and climate in establishing number of tourist and resort projects, the city's specialization was redirected towards major management and finance centers, and an investment hub with a completely different development path and future development specializations [25].

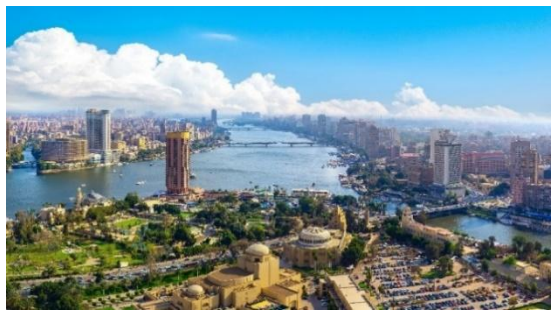


Figure 1. Skyline of Cairo
Source: freepik page

Figure 2. Dubai skyline

Figure 2 shows the stunning hyper-modern skyline of Dubai, a tale of exponential growth in skyscraper density in planned agglomerations. The jarring leap from low-rise buildings to skyscrapers, without the gentle increase that architecture usually follows, has a strong impact, feeling at times like vertigo.

The image shows Dubai's urban pattern, which has well-organized roads and a clear distinction between vertical and horizontal development. The city's signature can be easily seen in its ultramodern and iconic architectural forms, in particular, the towering skyscrapers, whose height and elevation could compete even with the most progressive forms of architecture.

However, this focus on the present and the all-encompassing implies that the skyline is virtually completely deprived of any local heritage or allusions in the round; the visual narrative is one of aspiration, economic influence, and technological existence--and, though it is terrific that Dubai has an urban identity that is recognizable and sellable, it also suffocates it in a pretence that is banal but which takes it out of the richness and reality of, say, older Arab cities.

2.3.3 Beirut

Although Beirut has not experienced the same urban development, orientation, density, and transformations as other cities in the region, it has conformed to them in terms of being heavily shaped by residential towers, which have been instrumental in redefining the geographical, consumption habits, and social and cultural activities of the city and suburbs. This model of development has been imported by various Banks and private investment companies and towers have been built in Beirut and its suburbs which strongly attract all forms of inhabitants and tenants [26]. Beirut's skyline is characterized by relatively low heights, with the majority of buildings having approximately 10 to 20 stories.

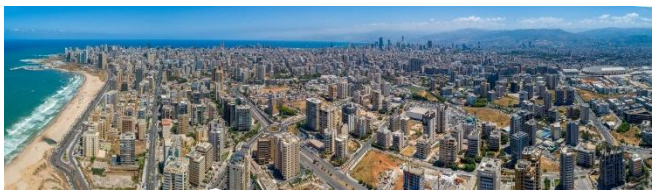


Figure 3. Beirut skyline
Source: Shutter stock image webpage

Figure 3 shows the skyline of Beirut, which is mainly composed of mid-rise buildings, usually with ten to twenty stories, and taller residential towers in between. This comparatively moderate vertical profile helps maintain a human-scale streetscape and integrate numerous new towers into the existing Mediterranean and Levantine urban fabrics without overwhelming them.

The final result is an urban landscape that balances between moderate modernity and historic continuity that symbolizes the nature of Beirut as a cosmopolitan, multicultural crossroads. Nevertheless, this strategy has given the city a sense of continuity and connection to the modern era of changes against the pressures of development (Figure 4).

Figure 4. Role of stakeholders in urban transformation

Many planning authorities contribute significantly to changing the cation identity of different regions of the Arab city. Nevertheless, in the case of Baghdad, the role of various stakeholders in the urban transformation process must be addressed.

As shown in the diagram, there are three key actors: the government, the private sector, and civil society.

The private sector is a strong force of change, driven by economic factors and investment opportunities. Recent tower construction has been dominated by private developers and investors who often do not have the interests of the community or cultural heritage in mind, but rather their own interests in the form of profit. The changing nature of the Baghdad skyline has been achieved by this dynamism, sometimes at the cost of visual memory and even social unity.

Civil society includes groups like NGOs, professional associations, and community groups. They try to support heritage but do not have enough power to balance the strong influence of private companies in Baghdad. These groups can organize and influence decisions on big projects. It is important for them to make sure that city development considers what local people need and want.

3. METHODOLOGY AND CASE SELECTION

This study applies a representative sampling in the urban space to examine the changes in the identity of Baghdad through:

1. The 12 residential investment projects (six in Karkh and six in Rusafa) identified as points of focus for the morphological and social evaluation. These are specific projects that have been selected for three reasons.

•Spatial Distribution: The projects are the principal poles of growth both in the city's sectors (e.g., Al-Jadriya, Mansour in the sector of Karkh and Zayouna, Adhamiya in the sector of Rusafa).

•Typological Diversity: They include different architectural styles and heights and thus represent the "new standard" of investment housing.

•Contextual Friction: The projects are in or near established low-rise residential fabric, making it appropriate for measuring the "morphological rupture" and its effect on privacy.

2. Participant Survey: A survey was distributed to 384 people in the population of metropolitan Baghdad. Participants were chosen to represent not only those living under the shadow of the towers but also those living in traditional neighborhoods to ensure a holistic view of the citywide identity crisis.

3. Visual Evaluation: Field observations and concept mapping were used to record the contrast between the traditional "human scale" and the new "vertical scale" in the twelve selected sites.

The sample was stratified to ensure equal representation from the two sectors of Baghdad, Karkh, and Rusafa (Table 1).

Table 1. Geographical distribution of the survey sample (N = 384)

City Side	Key Districts Represented	Sample Size (n)	Percentage (%)
Rusafa	Adhamiya, Karada, Zayouna, Al-Dora, Al-Rusafa Historic Center	196	%51
Karkh	Al-Jadriya (Core Case), Mansour, Yarmouk, Kadhimiyah	188	%49
Total	Across Metropolitan Baghdad	384	%100

The study adopts a descriptive–analytical approach that combines case studies of twelve investment nodes in Karkh and Rusafa, comparative discussion with Cairo, Dubai and Beirut, and secondary data (archives, planning documents and field observations

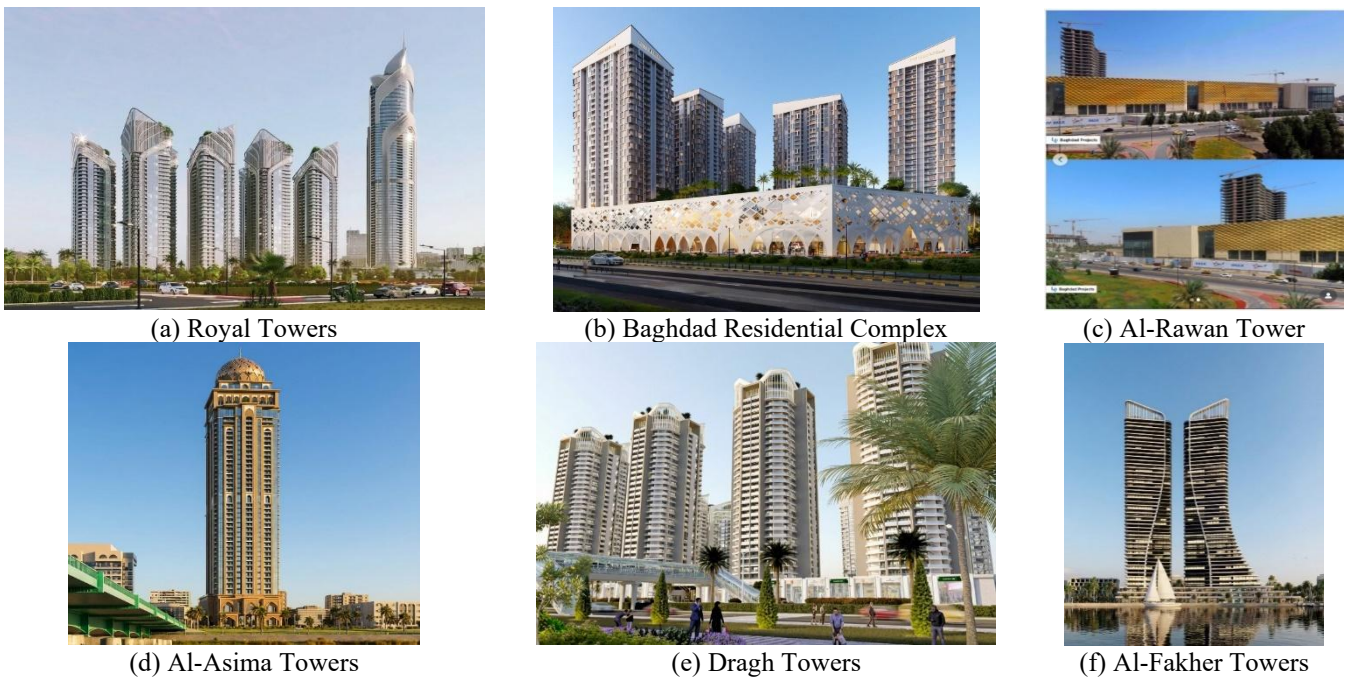
Considering the tower mall at the Al-Jadriyah Bridge as a contemporary investment residential tower, the intersection of the conceptual and connotative frameworks of residential towers helps identify the future dimensions of this visual setting and the type of visual and functional distortions that such residential towers may cause in the visual image and identity of Baghdad. Despite the profound differences in the study, contemporary residential investment towers in the Iraqi capital enjoy structural and spatial similarities and close spatial proximity to the river, whether the Tigris River or its branches or side canals. This condition indicates the special importance of the water bodies as a potential for vertical urbanization and economic and investment activity [27, 28].

3.1 Study area: High-rise projects in Baghdad

Table 2 summarizes major high-rise projects in Baghdad and high rise residentials towers are shown in Figures 5 and 6.

Table 2. High rise projects in Baghdad

Project Name	Location in Baghdad	Number of Towers	Floors per Tower	Total Flats	Number of Residential Units
Downtown Baghdad Project (Main Tower)	Al-Bayjiya	8	65	320	1,300 (total complex)
Zayouna Residential Complex	Zayouna	5	41	160	1,230 (6 apartments per floor)
Royal Towers Project	Central Baghdad (Al-Mansour, Al-Bayjiya)	13	N/A	N/A	N/A
Jewel of Baghdad (Residential Towers)	Al-Dura (near Two-Story Bridge)	13	31	120+ (various)	Multiple (includes villas/houses)
Baghdad Residential Complex	Baghdad International Airport Street	31	N/A	N/A	3,800
Al-Asima Residential Towers	Opposite Al-Saydiya, Al-Daght Street	29	19	N/A	+3000
Harir Towers	Al-Doura, near Two-Story Bridge	N/A	N/A	N/A	N/A
Dragh Residential Towers	Al-Bayjiya	4	N/A	N/A	1014
Al-Fakher Residential Towers	Al-Qadisiya	3	54/ 49/ 60	N/A	N/A
Ahlam Dijla Towers	Arassat	3	60	N/A	N/A
Al-Rawan Tower	Al-Hussein Neighborhood (West Baghdad)	1	18	544	N/A
Nuwas Tower	Abu Nuwas Street	1	45	160	N/A

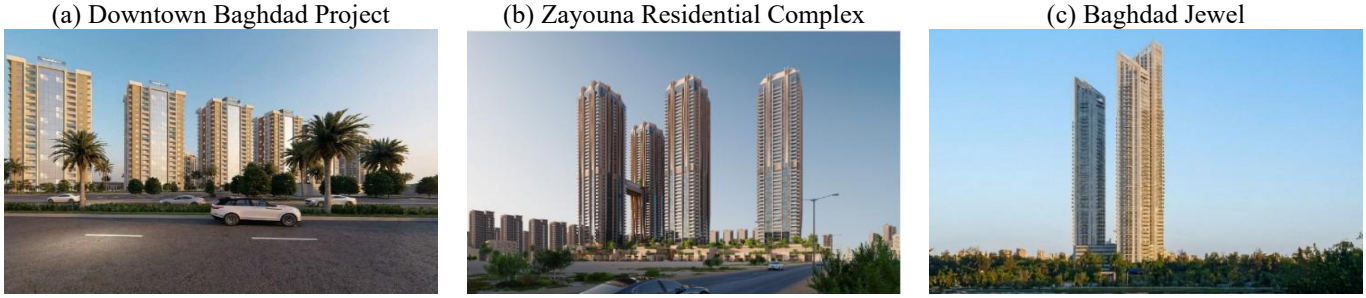


(a) Royal Towers (b) Baghdad Residential Complex (c) Al-Rawan Tower

(d) Al-Asima Towers (e) Dragh Towers (f) Al-Fakher Towers

Figure 5. High-rise towers in Karkh

(a) Downtown Baghdad Project (b) Zayouna Residential Complex (c) Baghdad Jewel



(d) Nuwas Tower (e) Harir Towers (f) Ahlam Dijla Towers

Figure 6. High-rise towers in Rusafa

3.2 Research methodology overview

This study is based on a mixed-methods research design that combines quantitative and qualitative approaches to achieve a comprehensive understanding of the impact of residential investment towers on the identity of the city of Baghdad.

The study uses a step-by-step approach. First, it collects and analyzes numbers and data. Then, it looks at people's experiences to understand the numbers better.

The two parts are combined in the discussion. Patterns of loss of identity, privacy concerns, and diminished 'feelings of attachment to places' are revealed by the numbers (survey, ANOVA and regression). Thirty individuals were interviewed to better understand the reasons for these patterns. They provide true-life stories that numbers cannot convey. The interviews not only provide additional information, but they also help to clarify the numbers. Table 3 describes the process of conceptualizing concepts, such as urban identity, visual memory, place attachment, and privacy, into actual survey items.

Table 3. Operationalization of key constructs and survey measures

Construct	Example Survey Items	Item Source
Urban identity (visual and symbolic)	The new residential towers reflect Baghdad's architectural and cultural character, and high-rise- residential towers improve the visual image of the city's skyline.	Self-developed items, informed by literature on Arab urban identity and skyline transformation
Visual memory and historic continuity	Investment in residential towers erases important visual memories of Baghdad, and the presence of high-rise- towers makes traditional Baghdadi neighborhoods less recognizable.	Self-developed, based on local debates on visual memory and heritage preservation
Place attachment and sense of belonging	I feel the same sense of belonging in tower apartments as in traditional Baghdadi neighborhoods.; Living in or near investment towers weakens my attachment to the neighborhood.	Adapted from place-attachment studies and adjusted to the Baghdad context
Privacy and overlooking	Residential towers negatively affect the privacy of surrounding low-rise- neighborhoods, as overlooking from high-rise- apartments makes traditional houses feel exposed.	Self-developed items reflecting local concerns about privacy and overlooking
Social interaction and cohesion	Living in residential tower compounds encourages social interaction and neighborly relations. (reverse-coded); Residential towers create social distance between residents and their neighbors.	Self-developed, drawing on literature about gated communities and vertical living
Perceived economic impact	Investment towers increase property values in the surrounding area, and residential towers stimulate local economic development and provide services.	Self-developed based on urban-economy and gentrification literature
Planning and governance	There is adequate planning control over the location and design of residential towers in Baghdad. (reverse-coded) New towers are being built without sufficient consideration for heritage and local communities.	Self-developed items based on planning and governance debates in Baghdad

Note: All items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.3 Sampling frame and stratified systematic sampling

The sampling frame for the quantitative strand comprised adult residents (aged 18 years and above) living in metropolitan Baghdad in areas that either directly contained investment residential towers or were located within adjacent traditional low-rise neighborhoods affected by developments. Based on municipal records and local planning documents for Karkh and Rusafa, an approximate population of 12,000 households in and around the 12 identified tower projects was used as the operational sampling frame.

Stratified systematic sampling technique was used to guarantee structural representativeness of the study areas. Two strata were identified: (1) households living within the

investment residential tower and (2) households living within low-rise neighbourhoods adjacent to the towers within the visual and functional catchment areas. To ensure a representative spatial distribution, within each stratum, housing units were selected through a systematic approach (e.g., every k-th house was approached, according to the field quota). The final sample resulted in an approximately even splitting of the tower dwellers and traditional neighborhood dwellers of 45 percent to 55 percent.

To avoid large deviations from the sampling frame in terms of sociodemographic characteristics, these were continuously monitored during the process of data collection, including age, sex, and education. Therefore, no post-stratification weighting procedures were considered necessary, and these sociodemographic factors were controlled in the regression models. In addition, a purposive sampling approach was used in the qualitative phase, resulting in 30 semi-structured interviews. This provided a full picture of the narratives of both people and institutions, including urban planners, municipal officials and real estate investors.

Thirty people took part in the study. They included city planners, city officials, private investors, and long-term residents from both tower complexes and nearby traditional neighborhoods. These participants were chosen on purpose to show both official views on planning and investment and the daily lives of people living in areas affected by tall residential buildings.

For the quantitative strand, chi-square tests were employed to examine associations between categorical variables, such as residential context (tower vs. traditional neighborhoods) and perceived privacy or identity loss. One-way analysis of variance was used to compare the mean scores of the composite indices of urban identity across different residential locations and sociodemographic groups. Finally, multiple regression analysis was applied to assess the combined effect of tower proximity, floor level, and socioeconomic characteristics on the overall perceived identity transformation scores.

3.4 Statistical assumptions and data treatment

Some assumptions of statistics were checked before conducting the inferential analyses. The items were combined into four main indices (urban identity, visual memory, place attachment, and privacy), each measured using a 5-point Likert scale. The use of these composite indicators as interval-level data is statistically sound according to standard statistical doctrine because the samples are larger than 200.

These composite Likert-type indexes were assumed to be approximately interval-level data for ANOVA and regression analysis, a common statistical practice in large samples as recommended by Norman [29].

The constructs used in this study were drawn deductively from a number of well-established constructs in the literature on urban sociology and planning (Table 3), which provided a conceptual guarantee of the structural validity of the items. Therefore, the reliability of the instruments was determined based on Cronbach's alpha method instead of redundant factor modeling. The coefficient internal consistency for all composite scales was found to be within the range of 0.76–0.81, indicating high internal consistency for all scales.

The Shapiro–Wilk test is typically used for normality testing of parametric test assumptions; however, in large samples (N = 384), the test is too sensitive to minor deviations. The skewness and kurtosis values for all composite variables were found to be within an acceptable range of ±2.0, indicating that the data were normally distributed.

Furthermore, homogeneity of variances was supported by non-significant results in Levene's test, satisfying the assumptions for the one-way ANOVA. Finally, to ensure the robustness of the multiple regression analysis, the variance inflation factor (VIF) values were examined; all predictors yielded VIF values below 3.0, confirming the absence of problematic multicollinearity.

4. RESULTS

As shown in Table 2, Baghdad currently hosts eight under-construction and seven planned residential tower projects.

The case study reveals several conclusions regarding investments in residential towers and their effects on Baghdad's urban identity.

- Today's investment giants have ushered in new forms that barely consider a city's history and culture.
- These processes contribute to social stratification and alienation in traditional societies.
- The development of urban plans has failed to safeguard cultural heritage, resulting in the loss of neighborhood identity.

4.1 Survey findings

Residents' Perceptions The survey findings, as summarized in Table 4, show a major conflict between new vertical developments and the local sociocultural environment.

- Identity and Belonging: Most respondents (52%) disagreed that the new towers portrayed the traditional identity of Baghdad, stating that they introduced typologies that did not identify with the local architectural language. As a result, nearly half (50%) of the participants stated that they felt less belonging to such high-rise neighborhoods than they felt in a traditional quarter, indicating that vertical housing can compromise the well-established attachment patterns of place.

To statistically explore this association, a chi-square test of independence was used to examine the categorical association between living in towers versus traditional low-rise neighborhoods with the perceived sense of belonging. This analysis showed a statistically significant association ($\chi^2(2) = 18.74$, $p < 0.001$) and a moderate effect size (Cramer's $V = 0.22$). At the same time, a Spearman rank-order correlation was carried out to examine the direction of the correlation between tower proximity (as represented by an ordinal variable based on distance bands) and composite place-attachment ratings.

The findings showed strong, negative and statistically significant relationship ($r_s = -0.624$, $p < 0.001$), meaning there is a strong association between proximity to investment towers and decreased place attachment. The quantitative patterns were further elaborated upon in the qualitative interviews: some of the interviewees explicitly indicated that their loss of a sense of belonging was linked to architectural foreignness, one of the long-term residents of Adhamiya saying that 'the towers do not speak our language—they belong to a city we don't recognize'. This qualitative understanding of the phenomenon is the reason that the proximity to a tower is the best regression predictor ($\beta = 0.41$); it also exists as a symbolic representation of cultural displacement. Visual Impact vs.

Housing Needs: The visual impact was split between 35% of the respondents viewing the towers as an indicator of modernization and 44% viewing it as visual pollution that ruins the historic skyline. Nevertheless, these developments are being pragmatically accepted, as 57% of respondents believe that to solve the housing shortage in Baghdad, there is a need to have investment towers. This highlights the two functions of towers: they serve as a solution by providing housing and as a problem-maker by causing identity loss.

Table 4. Research methodology overview – Study design, sampling, and analysis plan

Section	Main Category	Sub-Category	Details / Values
Study population and research sample	Quantitative strand (survey)	Study population	All residents living in and around investment residential towers in Baghdad
	Quantitative strand (survey)	Sample size – quantitative	N = 384 residents (tower residents and surrounding neighbourhood residents)
	Qualitative strand (interviews)	Study population	Key stakeholders involved in planning, investment, and local governance
	Qualitative strand (interviews)	Sample size – qualitative	N = 30 participants (urban planners, local residents, investors, and government officials)
Sampling strategy	Quantitative strand	Sampling method	Stratified random sampling (tower residents vs. traditional neighbourhood residents)
	Qualitative strand	Sampling method	Purposive sampling (experts and officials selected for their role in planning and investment)
Data analysis methods	First: Quantitative analysis	Descriptive statistics	Averages, standard deviations, frequencies
	First: Quantitative analysis	Inferential statistics – Test 1	Chi-square test (associations between residential context and perceived privacy / identity loss)
	First: Quantitative analysis	Inferential statistics – Test 2	One-way ANOVA (differences in urban identity indices across residential contexts and age groups)
	First: Quantitative analysis	Inferential statistics – Test 3	Multiple regression analysis (effect of tower proximity, floor level, and socio-economic variables on perceived identity transformation)

Note: 384 = residents (quantitative survey), while 30 = experts/officials/locals (qualitative interviews)

Table 5. Multiple regression model predicting perceived identity transformation

Predictor Variables	Unstandardized B	Standard Error (SE)	Standardized Beta (β)	t-value	p-value	VIF
Constant(	1.845	0.21	-	8.78	0.001 >	-
Tower Proximity (Ordinal)	0.524	0.061	0.412	8.59	0.001 >	1.15
Floor Level	0.312	0.068	0.235	4.58	0.001 >	1.22
Household Income	0.205	0.057	0.174	3.59	0.001	1.08

Note: Model Summary: $R = 0.736$, $R^2 = 0.542$, Adjusted $R^2 = 0.538$, $F(3, 380) = 23.67$, $p < 0.001$. Dependent Variable: Perceived Identity Transformation

A one-way ANOVA of interview data contextualized this statistical divergence: planners and municipal officials acknowledged the pragmatic housing value of towers while simultaneously expressing concern about their visual incompatibility with Baghdad's historic skyline. One urban planning professional noted that 'we need the density, but the designs arrive as copies of Dubai or Istanbul — nothing local remains.' This explanatory layer accounts for the ambivalence reflected in the ANOVA results, where tower residents score differently from non-tower residents on urban identity indices. Also, statistically significant differences in mean urban identity scores were indicated across different residential contexts ($F = 14.82$, $p = 0.001$).

• Privacy and Social Cohesion: The most urgent issue has been found to be privacy. A majority (61%) of respondents felt that there was a massive invasion of their privacy by looking over the towers in the existing low-rise houses. Moreover, 44 percent of residents felt that tower living was socially isolating, unlike the high social connectivity in Baghdad in the traditional alleyways (mahallas). Multiple regression analysis yielded a significant model in which three key predictors—tower proximity, floor level, and household income—jointly predicted perceived identity transformation ($R = 0.736$, $R^2 = 0.542$, $F(3, 380) = 23.67$, $p < 0.001$). As shown in Table 5, tower proximity emerged as the strongest predictor ($\beta = 0.412$, $p < 0.001$), followed by floor level ($\beta = 0.235$, $p < 0.001$) and household income ($\beta = 0.174$, $p = 0.001$). Prior to the analysis, the statistical assumptions for multiple regression were strictly verified: normality of residuals was confirmed via the evaluation of skewness and kurtosis (values within ±2.0), supported by the visual inspection of Q–Q plots and standardized residuals. Homoscedasticity was supported by plotting residuals against predicted values, and VIF values for all predictors were strictly below 3.0, confirming the absence of problematic multicollinearity (Table 5).

The qualitative part of the study showed that people from traditional low-rise neighborhoods felt ignored. This feeling was more than just physical discomfort. They saw it as a violation of their important social and cultural norms of mahalla life. One female housewife from near a tower complex in Rusafa said she felt "as if the walls of our home have been taken out." This qualitative account directly accounts for some of the findings of the survey (61%) and why tower proximity was the strongest predictor of perceived identity transformation in the regression model.

• Policy Implications: In light of these issues, 71% of respondents were strong advocates of strict building codes for towers around historic sites. This finding provides empirical evidence for the necessity of buffer zones and view corridor protection (Table 6).

Table 6. summarizes the main survey findings on residents' perceptions of investment residential towers and their impact on urban identity, visual memory, and everyday life in Baghdad

Axis / Survey Item (5-Point Likert Scale)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Perceived compatibility with Baghdad's identity "The new residential towers reflect Baghdad's architectural and cultural character."	8% (31)	18% (69)	22% (85)	30% (115)	22% (84)
2. Impact on visual image and skyline—"High-rise residential towers improve the visual image of Baghdad's skyline."	15% (58)	20% (77)	21% (81)	25% (96)	19% (72)
3. Sense of belonging: "I feel the same sense of belonging in tower apartments as I do in traditional Baghdadi neighborhoods."	6% (23)	17% (65)	27% (104)	28% (108)	22% (84)
4. Privacy and overlooking—"Residential towers negatively affect the privacy of surrounding low-rise neighborhoods. "	32% (123)	29% (111)	18% (69)	13% (50)	8% (31)
5. Social interaction and cohesion inside tower compounds —"Life in residential tower compounds encourages social interaction and unneighborly relations. "	9% (35)	21% (81)	26% (100)	24% (92)	20% (76)
6. Overall housing satisfaction—"Overall, I am satisfied with living in, or in close proximity to them. "	18% (69)	32% (123)	20% (77)	19% (73)	11% (42)
7. Perceived role in addressing the housing crisis "Investment in residential towers is necessary to address Baghdad's housing shortage."	24% (92)	33% (127)	18% (69)	15% (58)	10% (38)
8. Protection of historic and traditional areas "The construction of new residential towers should be strictly restricted near historic and traditional neighborhoods."	41% (158)	30% (115)	15% (58)	9% (35)	5% (18)

5. DISCUSSION

To rigorously operationalize the sequential explanatory design, Table 7 presents a joint display integrating quantitative statistical evidence with qualitative explanatory mechanisms. This synthesis demonstrates how qualitative insights account for the structural relationships identified in survey data.

This study uses a step-by-step approach. It combines interview results to explain and give context to the survey data patterns. the statistical results established that tower proximity, floor level, and sociodemographic characteristics are significant predictors of perceived identity transformation ($R^2 = 0.542$). The qualitative strand now provides the experiential and institutional mechanisms through which these statistical relationships operate, moving from the 'what' of the quantitative findings to the 'why', which only qualitative voices can articulate.

The fact that they came out recently and the changes that had operated in the city attracted critical focus not only on their contribution to changing the identity of Baghdad but also on the resultant reaction of the citizens. Regardless of the criticism, the demand for these residential units is high; accordingly, the commission continues to set up towers.

5.1 Impacts on Baghdad's urban identity

The spread of investment high-rises in Baghdad and other Arab cities reconfigures urban identity by displacing long-standing communities, reinforcing socio-spatial stratification, and importing standardized design languages that weaken local distinctiveness. This leads to some form of social stratification, the emergence of enclaves that serve (and price out other) more affluent residents, and the marginalization or displacement of already existing, low-income communities. Such tendencies of action pose a threat of depleting social trust and emptying the combined cultural practices that Baghdad rests on [30].

Table 7. Joint display of quantitative predictors and qualitative explanatory mechanisms

Quantitative Core Theme	Statistical Evidence	Qualitative Explanatory Mechanism (Exemplar Quotes)
Identity & Belonging	$\chi^2(2) = 18.74$, $p < 0.001$ Cramer's V = 0.22	Residents expressed a deep sense of "architectural foreignness." A local planner noted: "These towers do not grow from Baghdad's fabric; they are dropped into it, creating a visual and psychological wall between old communities and new wealth."
Privacy & Social Cohesion	Regression: $\beta = 0.412$, $p < 0.001$ (Strongest Predictor)	The proximity of high-rise balconies causes structural visual intrusion into traditional courtyards. A resident stated, "We had to cover our courtyard. The tower next door completely killed our outdoor privacy. It feels like a continuous cultural violation."
Visual Memory & Attachment	Spearman: $r_s = -0.624$, $p < 0.001$	The disruption of the historical low-rise skyline diminishes place attachment. An interviewed architect explained, "The scales are broken." The visual memory of Baghdad is being choked by vertical concrete investments."

Luxury apartment buildings do more than change the skyline of Arab cities. They are also changing the city's look and feel. These buildings turn old neighborhoods into modern areas. They replace local features with things from other countries.

Investment towers in Baghdad and other Arab cities often copy architectural styles from places like Dubai or Cairo. They do not show the local culture. This trend makes Baghdad look similar to many other cities [31].

The predominance of imports from design languages of different times and places displaces the emergence of new architectural forms that are authentic to local contexts and

reflect local roots and identities.

5.2 Visual and spatial encroachment

The design and size of investment towers dictate a new form of architecture in the city. These skyscrapers are changing the skyline of Baghdad and overwhelming the unity of architectural constructions that can be seen in traditional urban fabrics. Visual pollution is not only an aesthetic issue but also a humiliation to the sense of the group memory of a city, its historical roots, and the historical vestedness of the inhabitants [32, 33].

Simulations of high-rise developments, in place of the low-density neighborhood, have led to the deterioration of visual memories that were used to establish a sense of belonging to the state of settlement, creating an urban landscape that becomes more fragmented and disaffiliated with the heritage and cultural landmarks of Baghdad [34].

5.3 Governance and stakeholder dynamics

Weak enforcement of planning and heritage regulations has allowed speculative tower projects to proliferate in central Baghdad, with limited strategic guidance. The result of this scenario is the changes in downtown and central Baghdad that influence the visual image of the city [27, 35].

5.4 Disruption of traditional urban fabric

The construction of investment towers is planned and built in violation of existing urban regulations to introduce vertical density in areas where horizontal, socioeconomic-directed growth has prevailed historically. This radical shift from intimate, pedestrian neighborhoods to giant clusters of towers destroys what is known as the traditional city. These changes not only upset the city's layout but also affected its organizations and activities. They broke community connections and took the city back to a time of walled societies [36].

5.5 Problems of heritage protection and urban policy

The current cultural and architectural protection policies are not fully implemented as they ought to be. The construction of new buildings may occasionally be in a way that is inconsistent with the historic city image or not in accordance with the laws that already govern the planning of the city, which endangers visible and non-visible heritage. The tendencies towards a short-term economic development about the long-term cultural sustainability have been expressed to be supported by weak regulatory framework and poor stakeholder consultations and participation, especially in relation to local communities [37].

5.6 Psychological and social consequences

Urban landscape transformation has psychological implications for residents [38]. The deprivation of well-known visual elements and the relocation of the traditional population may give rise to feelings of alienation and a loss of the sense of belonging [39].

The disappearance of the urban environment in terms of its memorisation of its residents or cultural values may result in the loss of individual and collective identity, which may decline citizenship and civic participation [40, 41].

5.7 Comparative insights: Regional patterns

The situation in Baghdad is not exceptional. Other Arab capitals, such as Cairo, Beirut, and Dubai, have undergone a similar process of mutation underway where the unity of the historic skyline and the continuity of its history have been shattered by the recent boom in high-rise buildings in Cairo [26, 42].

In Dubai, ultra-modern and cosmopolitan urban forms of life have been prioritized, and have prevailed at the expense of local customs, while Beirut, in turn, has become more mature, with high-rise towers merging into the community and retaining the remnants of its Levantine Arab origins [43].

These comparative cases highlight the regionality of the issues and articulate the varying levels of success related to local governance, planning policies, and cultural focus [44].

6. CONCLUSIONS

Survey results show that 61% of people feel they lose privacy because of tower views. So, future tower rules in Baghdad should include minimum distances, height controls, and façade orientation rules to reduce visual intrusion.

A total of 52% of respondents believe that new towers do not reflect Baghdad's traditional identity, and chi-square analysis confirms a statistically significant categorical association between residential context and a reduced sense of belonging ($\chi^2(2) = 18.74$, $p < 0.001$, Cramer's $V = 0.22$). This pattern was further substantiated by a Spearman rank-order correlation confirming a strong negative relationship between ordinal tower proximity zones and composite place attachment ($r_s = -0.624$, $p < 0.001$). Design guidelines should require the integration of locally grounded architectural vocabulary, materials, and façade articulation.

Given that 44% of respondents described the towers as visual pollution affecting the historic skyline, buffer zones and view corridor protection should be enforced around heritage-sensitive urban areas.

As 71% of residents support stricter building controls near historic sites, municipal authorities should adopt stronger approval procedures and mandatory heritage impact assessments before licensing new tower developments.

Qualitative interviews and visual analysis indicate a tension between investment-led vertical growth and the sociocultural fabric of Baghdad; therefore, community consultation and context-sensitive planning reviews should become mandatory parts of major residential tower projects.

7. RECOMMENDATIONS

Reorienting the compass of vertical investments: the vertical investment compass invites residential towers to center on existing neighborhood centers or urban complexes, while a strict ban on their construction on sensitive land with heritage value overlooking riverbanks (such as the ancient Abu Nawas Street) is imposed to avoid distorting the city's visual memory.

Protecting heritage and drawing inspiration from dynamic models: Enacting rigid preventive measures to protect heritage neighborhoods from vertical encroachment that obliterates the

traditional facades of these areas. In contrast, modern towers are designed to have integrated networks of public transport and waterways, a concept drawn from highly advanced urban designs in cities such as Dubai and Abu Dhabi.

Institutionalizing community participation in urban decision-making: Establishing the principle of "mandatory community consultation" as one of the major foundations of major development projects to enable local people to effectively contribute to the shaping of the process of urban renewal and the future of their areas.

Architectural integration between originality and modernity: Formulation and activation of precise and conscious architectural standards that lead developers to incorporate authentic heritage vocabulary in modern buildings, to form indicators of an urban fabric that maintains cultural identity, and, conversely, to meet the demands of contemporary life.

Protecting the green lungs of cities: Limiting the encroachment of cement in place of existing green spaces and gardens and strictly adhering to the support and maintenance of the protective "green belts" of cities to ensure the sustainability of the environmental balance and quality of life.

Implementing comprehensive and rigorous organizational planning: Adopting integrated urban organizational plans that succeed in establishing a delicate balancing mechanism between aspirations for modern development and the requirements of heritage preservation, as well as strong oversight mechanisms that assure effective implementation and full adherence to the laws.

Humanization of conditions of real estate investment: Restyling investment criteria toward economic returns, with an in-depth evaluation of social and cultural impact. We give priority to projects that promote and reinforce the urban identity of the city and reject projects that culminate in the obliteration or marginalization of urban features.

8. POLICY IMPLICATIONS

The findings suggest that future residential tower developments in Baghdad should be regulated through a more context-sensitive planning framework that directly responds to the social, visual, and cultural impacts identified in this study.

Since 71.4% of respondents believe that investment towers do not harmonise with Baghdad's traditional architectural character and 68.2% consider them a source of visual memory loss, municipal design regulations should require the integration of locally grounded architectural elements, materials, and elevations treatments in new tower projects.

81.3% of the respondents supported that the height of the towers was unacceptable and that restrictions should be placed on heights to preserve the skyline and the privacy of heritage areas, as well as providing protected viewing paths and buffer zones between the towers and important historical areas.

The survey results revealed public concern about the loss of privacy and social unrest in areas affected by vertical residential development, leading us to the need to update the rules for moving in heights, update the criteria for official approvals for development, adjust the distances between new and existing projects, and update window orientation controls.

Most (72.4%) respondents believe that specific areas should be allocated to the towers in the city and not exceeded, and the Municipality of Baghdad should determine the areas allocated for high-rise buildings based on the capacity of the infrastructure, urban specificity, and the acceptable distance between traditional low-rise buildings and new high-rise buildings.

85.4% of the respondents stated that the participation of the community in urban decision-making is insufficient and does not affect government decisions and recommended that high-rise residential tower projects be subjected to a questionnaire of the community's opinion before initiating the procedures of licensing, construction, and implementation.

71.1% of the respondents in the questionnaire linked the increase in high-rise residential tower projects in the city to traffic congestion in it and recommended that there be prior studies of the capacity of the roads, the availability of parking and service infrastructure, instead of relying entirely on the feasibility of the investment.

According to 74.7% of the respondents, the increase in high-rise projects in Baghdad has increased the value of real estate in Baghdad, and they expected economic benefits by 67.4%, but the results showed that these economic benefits were accompanied by social costs and the loss of the city's urban identity; therefore, the criteria for evaluating future projects should include cultural impact, social cohesion, and the preservation of urban identity in addition to financial returns.

The ANOVA results show statistically significant differences in attitudes by place of residence ($F = 14.82$, $p < 0.001$), with tower residents generally being more positive than residents of neighboring and distant areas, indicating that urban policy should not assume a uniform public response to high-rise development across Baghdad.

DATA AVAILABILITY

All primary data and statistical models used in this study are available to interested researchers upon request, in accordance with the privacy and data protection policies of the participants. The person interested can be contacted via the email listed at the end of the research to obtain the data.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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