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Physical Factors Affecting the Deterioration of the Urban Fabric of Haft Chenar and Beryanak Neighborhoods in Tehran, Iran

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ABSTRACT

Aims Due to the lack of proper infrastructure and the reduced performance of worn-out urban structures, these structures have become one of the most important urban challenges. The aim of this study was to investigate the factors contributing to wear and tear in the urban neighborhoods of Haft Chenar and Beryanak in District 10 of Tehran.

Methodology This research was conducted in three consecutive stages in 2025 in the Haft Chenar and Beryanak neighborhoods of Tehran, using a mixed-methods approach. A final list of 100 factors affecting burnout was extracted through semi-structured interviews with 16 experts in six dimensions. To analyze structural relationships, an interaction matrix questionnaire was designed, and its data were analyzed using MicMac software; the factors were classified into 4 categories: influential, affected, bimodal, and independent. To assess the current situation, a field survey was conducted by distributing 400 questionnaires to residents, and the quantitative data were analyzed using SmartPLS software.

Findings The impact of the economic dimension on the managerial dimension (coefficient=0.57) was the strongest positive relationship in the model. In contrast, the weakest relationship concerned the impact of the economic dimension on the environmental dimension (coefficient=0.128). The managerial dimension played a key, multifaceted role, not only being strongly influenced by the economy but also influencing the psychological (coefficient=0.532) and environmental (coefficient=0.564) dimensions. On the other hand, the social dimension also had a direct impact on the physical dimension (coefficient=0.268).

Conclusion The economic dimension is the strongest external influence (especially on management), the managerial dimension is the strongest internal influence (with a strong impact on the psyche and the environment), and the physical dimension of the context is the primary influencing factor on the deterioration of the urban fabric. The psychological dimension is the final influencing factor; its improvement depends on addressing the objective roots in other dimensions.

Keywords Fabric Deterioration; Urban Neighborhoods; Physical Factors; Urban Planning

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Introduction

Urban fabrics are the product of the mutual influence of social processes and space and are considered a geographical issue [Hosseinzadeh *et al.*, 2020]. The problems of deteriorated urban structures are an issue that has faced many challenges in the field of urban planning and, owing to the lack of adequate urban infrastructure and the declining performance of these structures after years of neglect, has become one of the most important urban challenges [Ebrahimi, 2021]. Many traditional urban fabrics that were once the pride of cities are today exposed to decline and destruction. A large part of the residents of those areas have moved away, and the specific cultural, historical, and social heritage of those historical neighborhoods has been lost or is being destroyed. These urban fabrics usually have historical and cultural values whose loss causes a kind of social fatigue in society [Kavoosi *et al.*, 2018].

Deteriorated urban fabrics refer to areas within cities that are vulnerable owing to physical deterioration and inadequate access to roads, facilities, services, and infrastructure, and have little environmental, economic, and (implicitly) social value [Babaei *et al.*, 2018]. Only a few buildings have remained stable; these buildings are relics of the past and represent the old identity of the fabric. Deteriorated urban fabric is an area within the legal boundaries of cities that is fragile owing to physical deterioration, inadequate access to roads, inadequate equipment and services, and vulnerable urban infrastructure. Such fabrics have low geographical, environmental, and economic value [Mohammadi Seyed Ahmadiyani & Kassim Almohammedawi, 2022]. In general, a decline in the efficiency of any phenomenon leads to its deterioration. When the life of part of a city is challenged for any reason, the urban fabric of that area becomes exposed to decline [Bromley *et al.*, 2005]. The deterioration of a fabric or its internal elements results from obsolescence or from the absence of development plans and technical supervision over the formation of that fabric [Lee, 1996]. Owing to the poverty of residents and owners, these fabrics have not had the opportunity for spontaneous renewal, and investors are also unwilling to invest in them. The deteriorated fabric of Tehran's neighborhoods is no exception to this rule. Today, extensive construction is taking place in other areas, while deteriorated fabrics are becoming more ruined day by day. However, in recent years attention has been paid to the city's deteriorated fabrics, and city officials are trying to find a solution to this problem.

Today, with the growing problems of human societies and their increasing intensification, and the decline in the quality of life and living standards of residents in various places, this concept has been widely used, such that most urban designers, planners, and decision-makers have paid more attention to it [Yeganegi, 2018]. In fact, the result of today's planning and design in urban fabrics will certainly reach the threshold of deterioration over time [Mesgaran Kermani *et al.*, 2022].

The city, as a spatio-temporal phenomenon, is built at a specific point. This phenomenon develops and grows in space and, in each historical period, converts its quantitative changes into the qualitative changes required by that period. If these two aspects are not coordinated and aligned, and "the time of the city" is set against "the time of the city", the urban climate and physical conditions lose their efficiency and ability to meet the present and future needs of residents [Bahra & Naderi, 2020]. Before the rapid growth of urbanization, urban spaces and the physical conditions of cities were shaped according to the needs of citizens and enjoyed optimal harmony. Therefore, the elements in cities, in addition to shaping the physical structure of cities, also represented the cultural and social values of their residents. With the rapid growth of urbanization resulting from domestic and foreign economic developments in the contemporary era, the country's urban system underwent major transformations that led to uncontrolled migration to cities [Mohammadi Seyed Ahmadiyani & Kassim Almohammedawi, 2022].

The passage of time and the lack of proper maintenance, owing to the shortage of investment needed to preserve deteriorated fabrics, have caused these fabrics to face specific characteristics such as inadequate access to the fabric, a shortage of suitable infrastructure facilities, environmental problems and high levels of pollution, and the absence of a policy for explaining and documenting urban design projects. It should be noted that examining the relationship between the concept of the deterioration component and its internal factors, in an internal relationship with the urban resilience system, is absolutely necessary [Jeddi Farzaneh, 2021]. As a result, urban organizations have designed plans to control such migrations; however, most of the measures taken by the responsible organizations have failed [Pacione, 2009]. In addition, the presence of numerous non-durable buildings, low property values, insecurity, and socio-cultural problems are other challenges. The instability of building materials and the poverty of residents in parts of the deteriorated fabrics of cities cause further deterioration of these fabrics [Amiri & Dehghanian, 2024].

The foundations of urban life collapse when the physical conditions of the city lose their function and cannot meet the current and future needs of its residents. This issue, which results from the conflict of time and place, is clearly evident in the old fabrics of Iran and has led to the collapse of urban spaces. This has caused the neglect of the central parts of the city and the abandonment of old and deteriorated fabrics, and ultimately leads to the destruction of old fabrics that contain part of the cultural identity and the ideas of various historical periods. Moreover, from a social and cultural perspective, the old fabrics or central areas of ancient cities are the manifestation of the authentic culture and behavior of Iranians and mirror the culture and a collection of

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the indigenous cultures of Iran. Therefore, to prevent disorder and chaos in the old fabrics of cities, attention to changes and logical evolution is necessary.

The first steps toward the revitalization of old urban fabrics should be sought in Western Europe, especially in France and England, because the beginning of the Industrial Revolution in these countries (1760–1830) and the subsequent development of industrialization led to greater experience of urbanism compared with other countries. In fact, the movement to revitalize city centers began in these countries 150 years ago [Nasr, 2016]. In Iran, however, changes in cities began in the Qajar period. In other words, the Industrial Revolution, by creating fundamental changes in production and social relations, and post-World War II reconstruction provided the basis for such developments in the West [Azkia, 2025; Kouhi-Esfahani, 2019]. The first attitudes toward old fabrics in Iran emerged in 1971 at the first seminar on the restoration of historical buildings and cities, where the issue of the protection and restoration of cities and buildings was discussed as an effective factor in the country's development.

In Hong Kong, research was conducted to identify the concept of sustainable urban design and to examine the essential factors required to improve social sustainability in urban renewal and regeneration projects, and the opinions of architects, designers, financial managers, and local citizens were collected and examined [Chan & Lee, 2008]. Strategies for the improvement and revitalization of abandoned and deteriorated residential areas of Ankara were examined in one study [Güzey, 2009], and the revitalization and reconstruction of such areas were introduced as spatial strategies for giving identity to the residents of these areas and increasing the facilities needed by citizens. In addition, in Iran, regarding the reconstruction of historical buildings and cities, theories and characteristics along with the evolution of common revitalization methods in architecture and the relationship with the environment, from physical spaces to living spaces, the factors of deterioration and destruction of historical cities, from individual buildings to urban fabrics, and the change of their foundations in architecture have been examined [Khajepour & Raoufi, 2018]. Improving the condition of deteriorated fabrics in achieving justice-oriented goals, responding to the needs of residents, the empowerment and social responsibility of the residents of these fabrics, promoting the mental and psychological health of residents, enhancing the sense of neighborhood belonging, promoting social security, improving the environment, reducing land use, and, overall, increasing the quality of life of the residents of neighborhoods in these fabrics are among the requirements for achieving sustainable urban development, which will have a profound effect not only on people's lives today but also on the quality of life of future generations [Sheikhi *et al.*, 2021].

Accordingly, this research was conducted with the aim of examining the physical factors of the deterioration of the urban neighborhood fabric in the Haft Chenar and Beryanak neighborhoods of District 10 of the Tehran metropolis.

Methodology

This research was conducted with a mixed qualitative–quantitative approach among the residents of the Haft Chenar and Beryanak neighborhoods of District 10 of the Tehran metropolis in 2025. The Haft Chenar and Beryanak neighborhoods, as some of the oldest neighborhoods of the Tehran metropolis in District 10, are socially and demographically more or less influenced by the conditions governing the cultural, social, and local fabric of this area. In terms of urban and regional access, these neighborhoods are connected to Komeil Street to the north, Qazvin Street to the south, the Navvab Safavi Expressway to the east, and Nowruzi and Ranjbar Streets to the west. Access to BRT routes and the presence of four stations of Metro Line 7, named Beryanak, Roudaki, Komeil, and Navvab, in this area have had a great impact on the accessibility, traffic, and transportation functions of these neighborhoods. In terms of access, traffic flow, and movement, the connection of these neighborhoods with the Navvab Safavi Expressway and the north–south BRT route of Tehran, and the presence of the Beryanak and Komeil metro stations, have improved the traffic, transit, and travel performance of citizens and increased the local attractiveness for choosing a place of residence. In terms of distinctive local features and culture, the Haft Chenar Wildlife Museum, the shrine of Imamzadeh Masoum, and various old parks are among the most prominent features of these neighborhoods (Figure 1).

To identify the physical factors and criteria of deterioration, the documents of urban plans, municipal reports, and related domestic and foreign studies were reviewed, and 110 initial components were extracted in four dimensions: physical, access, urban services, and environmental quality. The components were provided in the form of a questionnaire to 16 experts (faculty members in urban design and urban planning, related PhD graduates, urban managers of District 10, and experts of the urban regeneration company), who were selected by purposive sampling, so that they could evaluate, in two stages (evaluation and modification of the components and final consensus), the necessity of including each component (Table 1).

This process led to the removal of 10 components and the formation of a final set of 100 components. In the next stage, to analyze the relationships among the deterioration components extracted in the first stage, structural analysis and the cross-impact matrix method were used. At this stage, based on the 100 identified components, a questionnaire in the form of a 100×100 matrix was designed, and the experts were asked to rate the intensity of the effect of each component on the other components on a four-point scale from 0 to 3. In

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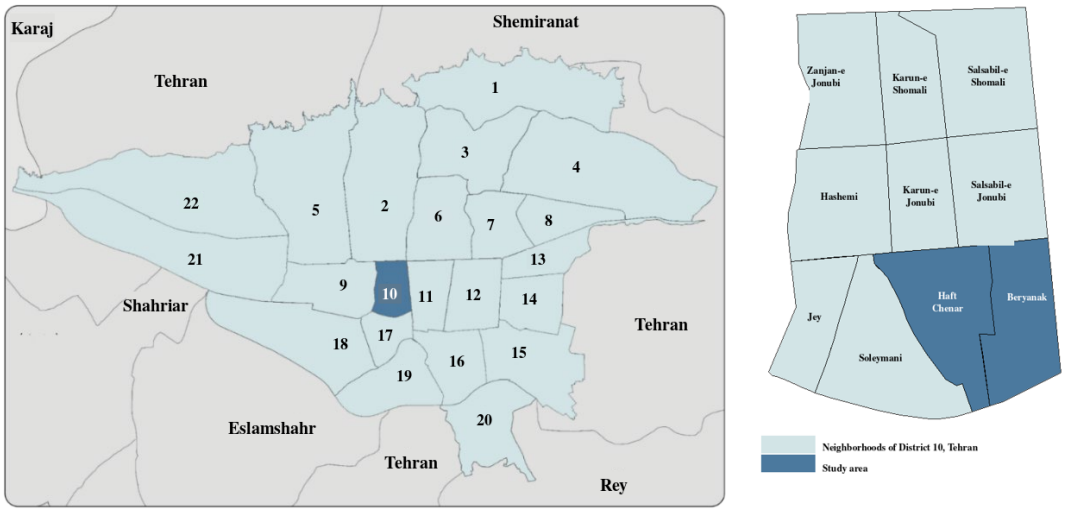

Figure 1) Location of District 10 of the Tehran metropolis and the study area

Table 1) General characteristics of the participants in the stage of confirming the physical components affecting deterioration

No.	Position	Specialty	Gender	Education	Work experience (years)
1	Full Professor	Urban design and urban planning	Male	PhD	25
2	Associate Professor	Urban design and urban planning	Male	PhD	20
3	Assistant Professor	Urban design and urban planning	Male	PhD	13
4	Assistant Professor	Urban design and urban planning	Male	PhD	11
5	Assistant Professor	Urban design and urban planning	Female	PhD	8
6	Instructor	Urban design and urban planning	Female	PhD	6
7	Postdoctoral Researcher	Urban design, urban planning, architecture	Male	PhD	4
8	Visiting University Lecturer	Urban design, urban planning, architecture	Male	PhD	7
9	Urban Development Plans Consultant	Urban design, urban planning, architecture	Female	PhD	5
10	Independent Researcher on Deteriorated Fabrics	Urban design, urban planning, architecture	Female	PhD	9
11	Head of Urban Planning Deputy	Urban design and urban planning	Male	Master's	18
12	Senior Urban Design Expert	Urban design and urban planning	Male	Master's	12
13	Urban Planning Expert	Urban design and urban planning	Female	Bachelor's	8
14	Fabric Monitoring Expert	Urban design and urban planning	Female	Master's	10
15	Senior Facilitator, Regeneration Company	Urban planning and facilitation	Male	Master's	16
16	Neighborhood Social Developer	Urban planning and facilitation	Male	Bachelor's	11

total, 12 expert questionnaires were completed, and after controlling for inconsistencies, the weighted mean of the responses was calculated. The final matrix was entered into MICMAC software, and the stability analysis was performed with two iterations of calculation. The software output classified the components into four groups—influential, dependent, bimodal, and independent components—and determined the network of relationships among the key deterioration indicators.

To measure the status of the deterioration indicators in the studied neighborhoods, a quantitative survey was conducted. The statistical population included the residents of the neighborhoods, local shopkeepers, and specialists related to urban management. Based on the approximate population of 85,000 people in the two neighborhoods and using Cochran's formula at a 95% confidence level and an error of 0.05, the sample size was estimated at 383 people. To increase accuracy, 400 questionnaires were distributed, and 392 valid questionnaires were returned. Sampling was performed by random cluster sampling among urban blocks. The validity of the 100-item questionnaire was confirmed by the assessment of 10 specialists. The reliability of the instrument was obtained using Cronbach's alpha coefficient for the whole scale, equal to 0.87.

The collected data were analyzed in Smart PLS 4.1.1.8. The measurement model was evaluated with factor loadings, composite reliability, and convergent validity, and all factor loadings were higher than 0.6. Then the structural model was run to explain the status and intensity of deterioration in different dimensions.

Findings

After qualitative content analysis of the interview texts, coding of the components, and merging of similar components, 100 components of neighborhood fabric deterioration were extracted in the form of six dimensions: physical (70 items with a total score of 166.11), economic (4 items with a total score of 8.12), social (9 items with a total score of 22.32), psychological (10 items with a total score of 24.80), environmental (4 items with a total score of 9.70), and managerial (3 items with a total score of 7.87). From the perspective of the residents of the studied neighborhoods, most physical indicators obtained scores higher than the mean (2.5). However, the indicator "area and size of

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Table 2) Mean scores of the 100 extracted indicators based on expert opinion

No.	Code	Indicator	Mean	No.	Code	Indicator	Mean
Physical (2.37±0.79)				**Physical (cont.)**			
1	Ph1	Height of buildings	2.45±0.82	36	Ph36	Ratio of roads and passages to buildings	2.60±0.79
2	Ph2	Number of floors	1.15±0.75	37	Ph37	Condition of sidewalks and pedestrian paths	2.14±0.82
3	Ph3	Type of building structure	3.7±0.91	38	Ph38	Access to the main road network from inside the neighborhood	2.59±0.91
4	Ph4	Area and size of plots	0.60±0.53	39	Ph39	Ease and permeability of access to the neighborhood	2.61±0.85
5	Ph5	Area of residential unit	2.35±0.88	40	Ph40	Location of residential unit relative to services	2.64±0.86
6	Ph6	Age of housing (time of construction)	1.05±0.72	41	Ph41	Location of the neighborhood relative to other important points of the city	2.56±0.75
7	Ph7	Quality of buildings	1.50±0.79	42	Ph42	Presence of arterial streets	2.10±0.84
8	Ph8	Building coverage ratio	1.05±0.69	43	Ph43	Local access from main arterial routes	2.85±0.81
9	Ph9	Number of rooms in residential unit	1.50±0.76	44	Ph44	Access to major cultural and religious centers	2.40±0.85
10	Ph10	Presence of elevator in building	2.20±0.93	45	Ph45	Access to daily shopping centers	2.80±0.91
11	Ph11	Facade building materials	4.00±0.85	46	Ph46	Access to parks and public green space	2.37±0.89
12	Ph12	Type of building unit	2.55±0.87	47	Ph47	Access to health centers	2.78±0.88
13	Ph13	Privacy of residential unit	2.35±0.76	48	Ph48	Access to educational centers	2.75±0.79
14	Ph14	Presence of parking in building	2.90±0.95	49	Ph49	Presence and quality of cycling paths	2.00±0.75
15	Ph15	Distribution of natural light inside residential unit	2.21±0.93	50	Ph50	Access to public transportation services	2.81±0.89
16	Ph16	Arrangement of urban space in the neighborhood	2.57±0.88	51	Ph51	Presence of public parking in the neighborhood	1.90±0.72
17	Ph17	Design of the neighborhood fabric	2.71±0.79	52	Ph52	Presence of park space or on-street parking	2.38±0.81
18	Ph18	Position of the plot in the urban block	1.05±0.69	53	Ph53	Quality of public transportation vehicles	2.70±0.75
19	Ph19	Permeability of the fabric	1.50±0.75	54	Ph54	Traffic and congestion in the neighborhood	2.14±0.74
20	Ph20	Compatibility and relationship of land-use patterns	2.59±0.92	55	Ph55	Land-use mix in the neighborhood	2.64±0.80
21	Ph21	Grain-size class of plots in the neighborhood	2.27±0.77	56	Ph56	Land-use diversity in the neighborhood	2.77±0.72
22	Ph22	Mass–space composition	2.36±0.89	57	Ph57	Land-use compatibility in the neighborhood	2.70±0.82
23	Ph23	Age of the fabric in the neighborhood	2.64±0.74	58	Ph58	Pedestrian accessibility to school, park, and shopping centers	2.68±0.81
24	Ph24	Type and pattern of physical development of the neighborhood	2.64±0.81	59	Ph59	Distribution of urban services in the neighborhood	2.63±0.73
25	Ph25	Building density	1.85±0.80	60	Ph60	Access to sensitive land uses (fuel stations)	2.37±0.77
26	Ph26	Population density in the neighborhood fabric	1.61±0.74	61	Ph61	Robustness of buildings by land use	3.13±0.94
27	Ph27	Percentage of residential units	1.82±0.79	62	Ph62	Cultural and historical buildings and sites in the neighborhood	1.65±0.86
28	Ph28	Abandoned, unused, and indefensible spaces	2.02±0.90	63	Ph63	Adaptation of pedestrian space for people with disabilities	1.90±0.74
29	Ph29	Structural and building insurance	2.12±0.81	64	Ph64	Quality of urban drinking water facilities and infrastructure	2.78±0.82
30	Ph30	Safety of buildings against hazards	2.79±0.83	65	Ph65	Quality of gas supply facilities and infrastructure	3.08±0.90
31	Ph31	Status of reconstruction and improvement of buildings	2.66±0.79	66	Ph66	Safety of electricity supply facilities and infrastructure	2.94±0.89
32	Ph32	Attention to traffic facilities and equipment of the neighborhood	2.35±0.75	67	Ph67	Quality of telecommunication facilities and infrastructure	3.10±0.93
33	Ph33	Width of passages, roads, and alleys	2.54±0.81	68	Ph68	Condition of the urban sewage network and facilities	3.05±0.90
34	Ph34	Type of urban transportation network fabric	2.60±0.84	69	Ph69	Population with electrical power and water supply sources	2.64±0.88
35	Ph35	Width of neighborhood roads	2.55±0.80	70	Ph70	Potential capacity to protect buildings and infrastructure	2.14±0.78
Economic (2.03±0.75)				**Economic (cont.)**			
71	Ec1	Land value and price in the neighborhood	1.75±0.73	73	Ec3	Rent and building service charges in the neighborhood	2.30±0.75
72	Ec2	Number and value of housing facilities (loans) in the neighborhood	2.57±0.77	74	Ec4	Maintenance and repair costs of residential unit	1.10±0.71
Social (2.48±0.74)				**Social (cont.)**			
75	So1	Participation in collective neighborhood activities	2.44±0.82	80	So6	Strengths of the neighborhood outweighing its weaknesses	2.36±0.80
76	So2	Social credibility and reputation of the neighborhood	2.58±0.79	81	So7	Relationships, socializing, and interactions among neighbors	2.63±0.79
77	So3	Feeling of pride in living in the neighborhood	2.46±0.80	82	So8	Knowing neighbors in the neighborhood	2.79±0.75
78	So4	Willingness to stay and not leave the neighborhood	2.28±0.78	83	So9	Presence of spaces for social interaction	2.17±0.81
79	So5	Feeling of attachment, belonging, and integration with the neighborhood	2.61±0.83				
Psychological (2.48±0.77)				**Psychological (cont.)**			
84	Ps1	Sensory richness in the neighborhood	2.29±0.77	89	Ps6	Cleanliness of gutters and roads	2.42±0.81
85	Ps2	Interior design of residential unit	2.46±0.80	90	Ps7	Duration of residence in residential unit	2.38±0.86
86	Ps3	Desirable view and landscape from residential unit	2.53±0.75	91	Ps8	Duration of residence in the neighborhood	2.40±0.73
87	Ps4	Beauty and attractiveness of the neighborhood	2.41±0.79	92	Ps9	Building ownership	3.00±0.91
88	Ps5	Beauty of visual scenes	2.26±0.85	93	Ps10	Feeling of calm and comfort in the neighborhood	2.65±0.83
Environmental (2.43±0.80)				**Environmental (cont.)**			
94	En1	Geographical conditions	2.10±0.75	96	En3	Green space	2.52±0.85
95	En2	Atmospheric condition of the neighborhood in terms of industrial and traffic pollution	2.56±0.87	97	En4	Ventilation and air quality inside residential unit	2.52±0.77
Managerial (2.62±0.81)				**Managerial (cont.)**			
98	Ma1	Presence of a crisis management center for managing incidents	2.60±0.73	100	Ma3	Compliance with technical regulations and construction guidelines	2.60±0.80
99	Ma2	Quality and quantity of handling building violations	2.67±0.81				

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plots" (0.60 ± 0.53) received the lowest score among all deterioration indicators. In the economic dimension, 3 of the 4 indicators obtained scores lower than the mean. In the social dimension, 4 of the 9 indicators had scores lower than the mean. A positive point was that all environmental and managerial indicators obtained scores higher than the mean. The managerial dimension, with a mean of 2.62 ± 0.81, ranked highest (Table 2).
The fill rate of the 100×100 matrix was more than 91%. The physical dimension was placed in four categories—influential, dependent, bimodal, and independent; the economic dimension in the influential, bimodal, and independent categories; the social, environmental, and managerial dimensions in a single independent category; and the psychological dimension in the dependent and independent categories (Table 3).

Table 3) Classification of the 100 indicators according to the MICMAC model

Category	Indicators
Influential	Ph24, Ph31, Ph21, Ph27, Ph70, Ph22, Ph19, Ph5, Ph4, Ph3, Ph30, Ph13, Ph29, Ph8, Ph14, Ph33, Ph36
Bimodal	Ph17, Ec1, So4, Ph41, So6, Ph26, Ph23, Ph12, Ph6, Ph18, Ph7, Ph25, Ec3, Ph2, Ph1
Dependent	Ps8, Ps10, Ps7, Ps9, Ps4, Ps1, Ph16
Independent	So8, So1, So7, So9, Ma1, Ps6, En2, En3, Ph53, Ph60, Ph62, Ph69, Ph34, Ph32, Ph55, So3, Ph56, Ph57, Ph3, Ph49, Ph9, Ph11, Ph63, Ph28, Ph68, Ph50, Ph51, Ph64, Ph65, Ph66, Ph39, So2, Ph54, Ph52, Ph15, Ph59, Ph63, Ph11, Ph9, Ph47, Ph45, Ph47, Ps2, Ph46, En4, Ma3, Ph42, Ph61, So5, Ph40, Ph43, Ph58, Ph37, Ph10, Ph38, Ph36, Ec2, Ph20

All relationships between the deterioration dimensions in the Haft Chenar and Beryanak neighborhoods were significant. Among the identified relationships, the effect of the economic dimension on the managerial dimension (coefficient 0.57) was the strongest positive relationship in the model. In contrast, the weakest significant relationship was the effect of the economic dimension on the environmental dimension (coefficient 0.128). The managerial dimension played a key and multifaceted role: it was not only strongly influenced by the economy but also had a significant effect on the psychological (coefficient 0.532) and environmental (coefficient 0.564) dimensions. On the other hand, the social dimension also had a direct and considerable effect on the physical dimension (coefficient 0.268) (Table 4).

Table 4) Comparison of the mean effect coefficients of the deterioration dimensions of the Haft Chenar and Beryanak neighborhoods on one another

Path	Mean	t	Sig.
Social → physical	0.268±0.037	7.337	0.001
Economic → social	0.480±0.047	10.222	0.001
Economic → psychological	0.228±0.042	5.427	0.002
Economic → environmental	0.128±0.052	2.476	0.001
Economic → managerial	0.570±0.049	11.671	0.002
Economic → physical	0.214±0.040	5.386	0.001
Psychological → physical	0.220±0.036	6.047	0.002
Environmental → physical	0.121±0.031	3.951	0.001
Managerial → psychological	0.532±0.042	12.62	0.001
Managerial → environmental	0.564±0.038	14.787	0.001
Managerial → physical	0.291±0.038	7.576	0.001

Discussion

This research was conducted with the aim of examining the factors of deterioration of the urban neighborhood fabric in the Haft Chenar and Beryanak neighborhoods of District 10 of Tehran in 2025. The phenomenon of urban deterioration is a problem beyond mere physical inefficiency that targets the economic life, social cohesion, mental health, and environmental balance of residents at the neighborhood scale. This phenomenon is a complex system of intertwined problems whose understanding and analysis require moving beyond a one-dimensional view and adopting a holistic and systematic approach. The present study, with the aim of identifying, weighting, and structurally analyzing the factors affecting deterioration in the Haft Chenar and Beryanak neighborhoods of Tehran, has tried to reveal the hidden dimensions and causal relationships of this problem using a mixed methodology including qualitative content analysis, structural equation modeling (PLS), and structural-interpretive analysis (MICMAC). The findings of this research confirm the multidimensional and intertwined nature of urban deterioration, such that neglecting any of its dimensions causes the totality of intervention strategies to fail. The results of the first stage of the research, which led to the extraction of 100 indicators in six dimensions—physical, economic, social, psychological, environmental, and managerial—clearly show that deterioration is not limited to physical erosion. This broad classification is consistent with the comprehensive definition of "deteriorated fabric" as a fabric that has deteriorated in various geographical, social, economic, and environmental dimensions and whose livability has decreased. Weakness in any of these dimensions can spread to the other dimensions and create a vicious cycle of decline. For example, high unemployment and low income (the economic dimension) not only erode the ability of residents to maintain and renovate housing (the physical dimension) but can also lead to a reduced sense of local pride and belonging (the psychological and social dimensions) and increased pressure on local resources.
The findings of this research regarding the multidimensional and intertwined nature of urban deterioration are deeply consistent with international theoretical frameworks. The global literature generally uses the term "urban decay" to describe this phenomenon and regards it not as a simple event but as a sociological process during which part of a city enters a stage of decline and decay owing to a set of intertwined factors [Abbott, 2012; Cuthbert, 2017]. This definition justifies the emphasis of the present research on a holistic approach. As noted in the literature, urban deterioration is not the result of isolated events; rather, it is the product of broad economic, demographic, and social changes that, together with inappropriate urban planning decisions, create a vicious cycle. For example, the movement of industries away from urban centers

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(deindustrialization) and the migration of wealthier residents to the suburbs (suburbanization), which has historically occurred in many Western cities, are prominent examples of these intertwined factors that have eroded the local economy and led to a decline in the quality of public services and facilities in central neighborhoods.

The multidimensional nature of urban deterioration emphasized in the present research has been confirmed in other studies. For example, research shows that the concept of urban livability is itself a multidimensional construct that includes indicators such as access to public transportation, health centers, safety, green spaces, and environmental quality, and its decline is clearly observable in deteriorated fabrics. Specifically, in District 7 of Tehran, analyses based on machine learning showed that the more deteriorated neighborhoods have the lowest level of livability and that factors such as access to public services and environmental health are at the top of residents' priorities. This confirms the close relationship among the functional, environmental, and social dimensions of quality of life [Moradi *et al.*, 2025]. In addition, a structural analysis conducted on the deteriorated fabric of Ahvaz using the MICMAC method also showed that the factors affecting the livability of these fabrics have a high degree of saturation (mutual dependence) (78.04%), which again confirms the systemic and intertwined nature of the deterioration problem. In that analysis, heterogeneous construction and insufficient allocation of resources and financial support were introduced as the most influential key factors, corresponding respectively to the physical and economic–managerial dimensions of the model of the present research [Goodarzi *et al.*, 2025].

The causal relationship between the economic dimension and the other dimensions, which lies within the vicious cycle referred to in the present research, has also been examined in detail in other studies. Studies show that urban deterioration is not merely the result of physical changes but is influenced by transformations in economic structures and population replacement, which lead to a decline in property values, the abandonment of ownership, and the intensification of social problems. Quantitative analyses at the neighborhood scale in Tehran also confirm this relationship; studies show that structural vulnerability and economic decline alone explain about 50% of the variance in the deterioration of urban fabric. This finding emphasizes the central and fundamental role of these two dimensions in initiating and perpetuating the cycle of decline. Economic weakness not only makes investment in renewal impossible but, by creating urban poverty and social isolation, also erodes the social capital necessary for collective action and participation in renewal. This process strengthens the sense of non-belonging and reduces social responsibility among residents, which itself is a major obstacle to any participatory renewal plan [Zebardast *et al.*, 2013].

The mutual effect of the economic and environmental dimensions, referred to in the present research as "increased pressure on local resources", can in fact appear in the form of deeper inequality in exposure to environmental hazards. Research in the field of environmental justice shows that poor and deteriorated neighborhoods, whose residents are often minority or low-income groups, are disproportionately exposed to industrial and environmental pollution [Downey & Hawkins, 2008]. Interestingly, this relationship is not simply causal; studies show that race and income interact in their effect on this inequality. For example, in the United States, an increase in income among white households, compared with black households at the same income level, brings a greater reduction in exposure to environmental hazards. This means that structural factors such as discrimination in the housing and lending markets limit the possibility of "escaping" polluted and deteriorated environments even for residents with relatively higher incomes in deteriorated neighborhoods (which in Tehran might be defined based on ethnicity, previous place of residence, or other indicators) [Downey & Hawkins, 2008]. Therefore, economic weakness in a deteriorated fabric does not merely mean an inability to renew physically, but rather means being trapped in an environment of lower environmental quality and greater health threats, which itself contributes to the intensification of the cycle of poverty and decline.

The output of the indicator-weighting stage provides a telling picture of the critical points and relative strengths in the studied neighborhoods. The lowest score among all indicators belonged to "area and size of plots" (0.6), which reflects the fragmentation and small size of property plots as one of the structural and fundamental obstacles to renewal. This is consistent with the findings of similar studies in Iranian deteriorated fabrics that emphasize problems arising from fragmented ownership and the lack of plot consolidation. For example, in a study analyzing the obstacles to the improvement and renewal of the deteriorated central fabrics of Yazd using multi-criteria decision-making methods, the problem of the fragmentation and small size of plots was identified and confirmed as one of the most important physical–ownership obstacles [Ziyari *et al.*, 2010]. This challenge complicates the renewal process in two respects: first, it sharply increases the transaction and coordination costs among numerous owners; and second, it eliminates the economic viability of renewal projects for private-sector investors, because it limits the possibility of implementing projects at an appropriate and profitable scale.

On the other hand, the fact that all indicators of the managerial and environmental dimensions scored above the mean is important. This shows that, despite deep problems, there are capacities in areas such as handling building violations, compliance with technical regulations, and the relatively favorable condition of

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green space and air pollution (compared with other dimensions) that can be considered as a point of support and a lever for initiating effective interventions. However, the low mean of the economic dimension (2.03) and the placement of indicators such as "land value and price" and "maintenance costs" in low ranks reflect the central challenge of livelihood and the local economy. This finding fully matches the results of studies that emphasize the poverty of residents and their economic inability as the main obstacle to the spontaneous renewal of deteriorated fabrics. For example, a study evaluating renewal policies for deteriorated fabric clearly shows that the weak economic power of residents and the low transaction value of properties not only reduce residents' motivation to invest in renewal but also minimize the neighborhood's attractiveness to outside investors and intensify the vicious cycle of poverty and deterioration [Saberifar *et al.*, 2023]. This indicates that, without strengthening the economic base of the neighborhood and the financial empowerment of residents, other renewal measures may not have a sustainable and complete effect.

The MICMAC analysis, by revealing the mutual relationships and determining the role of each indicator in the dynamic system of deterioration, provides a deeper layer of understanding. The 91% filling of the cross-impact matrix is itself evidence of the validity of the hypothesis of the intertwining of dimensions and the formation of a complex system. This degree of interconnection is also observed in other studies that have used this method to analyze complex urban problems.

In contrast, the concentration of dependent variables in the psychological dimension shows that the mental and emotional state of residents is largely an outcome variable affected by the performance of the other dimensions of the system. Improving these indicators requires treating the objective roots of the problem in the economic, physical, and managerial dimensions. This conclusion is fully consistent with the findings of environmental psychology and studies on the "sense of place attachment" [Rezaei *et al.*, 2023]. This clearly shows that residents' feelings and perceptions are a reflection of the objective conditions of their living environment, and to promote psychological well-being, the economic, social, and physical infrastructures must first be improved. Therefore, any planning for the renewal of deteriorated fabrics must consider these complex causal relationships and use an integrated and comprehensive approach in order to achieve sustainable and widely accepted results.

Despite providing a systematic and multidimensional analysis of urban deterioration, this research has limitations that should be considered in interpreting the findings and directing future research. First, the focus of the research on the two neighborhoods of Haft Chenar and Beryanak in Tehran, although it made in-depth analysis possible, limits the generalizability of the results to other deteriorated urban fabrics, especially in cities with different socio-economic, cultural, and managerial contexts. The dynamics of deterioration in small cities, historical cities, or neighborhoods with a specific ethnic composition may follow different patterns. Second, the mixed methodology, despite its strengths, depends on primary data collected through interviews and questionnaires. These data may be affected by the "subjective judgment bias" of respondents and experts. For example, the assessment of psychological indicators such as a sense of pride or security may be affected by momentary conditions or a tendency to give socially desirable answers. Third, although the obtained model shows complex causal relationships, it is a static model. Urban deterioration is a dynamic process that evolves over time under the influence of macroeconomic policies, demographic changes, and broader managerial decisions. This model does not fully represent the temporal dynamics of these changes and long-term feedbacks. For example, improved management in a short period may affect residents' psychology, but the effect of this psychological change on residents' economic investment in the long term requires a longitudinal study.

Considering these limitations, the following suggestions are offered to complement and develop the present research. It is suggested that future studies test this analytical framework in the deteriorated fabrics of other Iranian cities with different geographical and economic conditions (such as border, historical, or industrial cities), in order to identify "contextual patterns" of deterioration and make it possible to formulate locally adapted strategies specific to each region. To reduce subjective bias and increase objectivity, future research can use "objective secondary data" alongside subjective opinions. For example, the structural density indicator can be combined and compared with satellite images, economic indicators with neighborhood income data from the census, and environmental indicators with remote sensing data or air quality stations. Also, to overcome the static nature of the model, the use of system dynamics or agent-based modeling methods in future research is suggested. These methods can simulate how the relationships between dimensions change over time and under different policy scenarios (such as granting renewal loans or implementing large transportation projects) and help planners predict the long-term and secondary consequences of decisions. Finally, given the key finding of the research regarding the central role of the economic dimension, conducting more in-depth studies with qualitative methods (such as ethnography or oral history interviews) to examine more precisely the mechanisms by which poverty and livelihood insecurity affect the erosion of social capital, the motivation for renewal, and the psychological satisfaction of residents seems necessary. Such studies can find out how residents perceive economic constraints

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and how this perception affects their decisions to stay, participate, or invest in the neighborhood.

Conclusion

The economic dimension is the strongest external influencer (especially on management), the managerial dimension is the strongest internal influencer (with a strong effect on the psychological and environmental dimensions), and the physical dimension is the basis of the primary factors influencing the deterioration of urban fabric. The psychological dimension is the ultimate dependent factor, whose improvement depends on treating the objective roots in the other dimensions.

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