

# Influences of Cultural Factors, Modernization, and Western Architecture on House Structures of Kermanshah in the Qajar Era

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## ABSTRACT

The house represents social and cultural values. It is the place where family needs and expectations are met. Hence, a review of housing architectural developments could help better understand the culture, lifestyle, and architecture of the past. Since fewer studies have been concerned with historical houses in Kermanshah, Iran, the semantic and functional value of these houses have received less attention. Meanwhile, understanding the cultural, local, and built environment of these houses could help redefine the original and pioneering architecture that has emanated from the invaluable architecture of the past. This study aimed to elaborate on the influences of cultural factors, modernization, and Western architecture on the formation of the Qajar-era houses in Kermanshah. This study was quantitative-qualitative and fell under descriptive-analytical research. The statistical population of the study consisted of 10 Qajar houses in the city of Kermanshah which were selected from among the houses registered in the Iran National Heritage List and represented some artistic and architectural values. Also, the statistical population of the study consisted of 18 architecture experts and academic professors who were selected via purposive sampling, 11 of whom were selected via theoretical saturation. The study used interviews and Delphi questionnaires, and the analysis procedure involved thematic analysis and the fuzzy AHP. Results indicated that cultural factors with components (e.g., using traditional architectural concepts, using Western/European styles, and the presence of Western lifestyles and means), and modernization and Western architecture with components (e.g., extrovert and staircase-centered houses, English and French landscaping with extending lawns, Western columns and capitals, metal-made sloped rooftops, seven-colored clay tiles, decorative brickwork, and the Western-inspired projected frontispiece) were influential in how Qajar Houses were formed.

**Keywords:** Cultural Factors, Modernization, Western Architecture, Traditional Houses, Kermanshah, Qajar Era.

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## 1. STATEMENT OF THE PROBLEM

According to the Dehkhoda Dictionary, the house is a place where man lives and takes rest; it has evolved from the context of society over time and is what would be equivalent to the place taking the form of the “house”. Representing cultural manifestations of Iranian society, the house is the main component of a living space. However, Iranian architects and researchers have investigated this key component to a lesser extent (Haeri Mazandarani 2009). As stated, the house serves as the main space in architecture, which manifests cultural and social values of a society (Ebrahimi, Soltanzadeh, and Keramati 2017). For so long, the house was meant to be beyond what would be called a shelter, as spiritual features were represented in all stages of house construction, i.e., from its construction to living in it. Today, however, less focus is paid to qualitative issues, especially cultural and environmental characteristics, in constructing and utilizing housing projects (Arjmand and Khani 2012).

Constructing a house is a major cultural phenomenon as the structure, shape, and spatial fabric of the house are highly influenced by its cultural environment (Rapoport 2009). It is widely recognized that culture and lifestyle are closely associated with an architectural space as architecture can serve as a tool to measure the culture of a society. The house’s fabric and its structure interact with events and behaviors (life culture). In his works, Rapoport has elaborated on house structures and domestic life culture, arguing that various factors influence how a house is formed, the most important of which include family structures, subsistence, social ties between people, and their religious ideologies (Armaghan, Soltanzadeh, and Iranie Behbahani 2013). He went on to suggest that geographical locations, financial resources, geographical and social security, cultural characteristics, and finally, family structures could be among the main components that influence patterns of residential architecture (Varmaghani and Soltanzadeh 2020).

A review of Iran’s architectural developments indicates that the Qajar era is seen as one of the most important historical periods of Iranian architecture which has had major impacts on modern housing architecture patterns. The concept of space fabric, it is inferred, saw a very slow and incremental evolution up until the Qajar era, leaving Iranian architecture with fewer construction and design patterns. In the Qajar era, however, the land of Iran saw highly sophisticated and rapid [architectural] developments due to the influence of the Western world on Iranian society and ensuing cultural and social changes, as well as the blending of the Western culture with Iranian-Islamic characteristics (Molanaei and Soleimani 2017). The Qajar era can be regarded as a bridge linking traditional housing architecture

patterns to contemporary modern patterns.

The climate, culture lifestyles, social customs, and popular habits in different works of architecture in various regions help architects better focus on their future plans. Meanwhile, historical houses of each city constitute part of the cultural and historical identity of the people who have lived there (Karimi 2014). Currently, the Iranian city of Kermanshah is home to many prominent Qajar-era houses. Surveys have indicated that few studies have fully examined their various special characteristics, as looking into the cultural, local, and built environment needs of houses could generally help redefine the leading yet original architecture along the invaluable architecture of the past. The future architecture is said to be defined only by realizing and updating the successful and compatible patterns of the locally invaluable architecture. Hence, it is crucial for contemporary Iranian architecture research to help recognize the dominant roots and patterns of local housing architecture in various regions across Iran and in different historical eras and to generalize its implications to the future. In sum, the present study aims to answer the following questions:

1. What were the features shared by Kermanshah City’s Qajar-era houses?
2. How did modernization and Western architecture influence Kermanshah City’s housing architecture?
3. How did cultural factors shape Kermanshah City’s Qajar-era housing architecture?

## 2. LITERATURE REVIEW

Studies have so far investigated traditional houses in various cities across Iran and elaborated on how they were influenced by culture and lifestyles. The following briefly discusses some books in this regard, e.g., the books “Introduction to Iranian Residential Architecture - Introvert Typology” by Memarian (2008), “Climatic Study of Traditional Iranian Buildings” by Ghobadian (2008), and “House, Culture, Nature: A Study of the Architecture of Historical and Contemporary Houses” by Haeri Mazandarani (2009), which investigated traditional and contemporary Iranian houses under different climatic and cultural conditions.

The following also briefly discusses some articles published in this regard.

In the study, “Architecture and Culture in Tehran’s Noble Houses during the Qajar Period”, Armaghan et al. (2013) showed how family structures could shape and change the flexible house fabric, as family structures were found to shape house structures based on the separation of male and female spaces in the context of a social and religious system.

Kohnemouei and Sami (2017), in a study, “The Courtyard in the Structure of Traditional Iranian Houses (Qajar Period) and Its Evolution in the Structure of the Last Decade”, investigated the

courtyards in traditional houses in four hot and dry, hot and humid, cold and moderate, and humid climates. Findings showed that culture and climate contributed the most to the formation of courtyards in traditional Qajar-era houses. It was also found that culture and climate were found to have the highest influences on the formation of various courtyards and the introversion and extroversion of the courtyards, respectively.

In the study "Privacy in Architecture of Dezful Houses (Case Study: Qajar Era)", Momeni et al. (2017) investigated the factors that affected how privacy could be created in Qajar-era houses in Dezful. Their findings demonstrated that spaces in Dezful City's traditional houses had been separated into two interior and exterior sections, which had secured privacy by such measures as public and private arenas in different spaces, observing movement hierarchies, designing and using indoor iwans (porches), laying an ante-room before rooms, controlled windows, and creating intermediate corridors that linked spaces, not to mention others.

In the article, "Comparative Study of the influence of Culture and Climate in the Form of Qajar Houses in Shiraz and Kashan", Parvardinezhad et al. (2021) examined physical differences of Qajar houses in the two cities of Shiraz and Kashan. They found decorations and adornments of facades, forms of architecture, height, and areas of spaces represented climatic and cultural differences of people and their various tastes and attitudes.

In the study "The Effect of Culture on The Vernacular Houses in Northern Iran; Case Studies: Vernacular Houses in Babol and Babolsar", Jafari and Zabihi (2021) discussed the cultural components and lifestyles affecting local architecture, arguing that understanding the influences of culture on local houses required understanding various features of culture, its content elements, and how they could be related together.

In a study "Reflection of gender and lifestyle in the houses of the Qajar period in Ardabil", Mohammadzadeh et al. (2022) suggested that lifestyle and gender had influenced the architecture and construction of Qajar houses.

In the study "The House Decorations of Qajar Period and its Effect on Creating a Sense of Place (Case Study of the Houses of Mushir al-Dawla, Mu'tamun al-Atiba 'and Alam-al-Saltanah)", Zakerzadeh and Ghorbaninia (2022) showed that the decorations used in the Qajar-era houses had been influenced by the user's identity, and belonging and attachment to place, which had contributed to the sense of place in these houses.

In a study "An Investigation of Spatial Transformation of Historical Houses in Kerman Qajar Vs. the First Pahlavi", Ashrafganjouei, and Soltanzadeh Zarandi (2022) investigated the key distinguishing features of houses in the Qajar era and in the First Pahlavi era

in the city of Kerman. This study found that house designs in the First Pahlavi era enjoyed more freedom of action than those in the Qajar era. This was represented by an increasing diversity in the location of the second spatial plan layers, the layout of spaces around the courtyard, and also the non-emphasis on the need for harmony between contrasting facades or maintaining symmetry.

Concerning traditional Kermanshah houses, the study by Hojjat and Heidari entitled "Baghdadi Serai, Kermanshah: Samples of Iran-Iraq Interactions in the Qajar Period", found that architecture is also influenced by culture and has gone through some different cultural interactions. Despite similar patterns and designs in these houses compared to traditional Baghdad houses, one would notice that the [Baghdad serai] has been inspired by Iranian culture and architecture.

In the study (2019) "A Comparative Comparison of Typology of the Space Organization and Physical Elements of the Qajar-Pahlavi Period with Traditional Houses in Kermanshah", Taheri et al. concluded that Qajar-era houses featured an introverted structure; however, they were transformed into introvert-extrovert structures by the end of the Qajar era, while turning into extrovert forms by the Pahlavi era. As stated, traditional architecture and climatic and spatial indicators were more prominent in different periods. These indicators, however, became less significant and saw a growing number of Western-inspired features in the industrial and modern times.

In the study "Evaluation of Modern Architecture and Urbanism Development in Qajar Houses Architecture (Case Study: Kermanshah City in the Western Region of Iran)", Chaleshgar (2021) found that political, economic, social, and cultural developments in the urbanism development of the city of Kermanshah in the Qajar era influenced the evolving physical changes of the Qajar house architecture.

The majority of the research conducted on traditional houses tended to address general descriptions and historical classifications, as well as typologies of houses. In considering the extent to which house architecture is influenced by and related to culture, the environment, and society, it is important to investigate these factors and understand how they affect houses.

### 3. THEORETICAL FOUNDATIONS

As a representation of human thoughts about space, aesthetics and culture, architecture serves as a social phenomenon and has constantly influenced and been influenced by culture. Meanwhile, human nature and his thoughts have also led to the formation of culture, which has been effective in shaping architecture and the living environment. The growth and development of an architectural space are made by cultural concepts over time and are manifested in the place (Mirzaei and Luluei 2015). It is understood that the

culture of architecture has its roots in the traditional Iranian architecture spirit and contains some environmental characteristics and public culture in society (Hosseini and Ahmadzadeh 2018). Traditional Iranian architecture has been formed in conjunction with environmental and climatic conditions, as well as cultural values and principles. These values and principles emanate from Iranians' spiritual and religious ideologies. For this, these values can be remembered as underlying sustainable architecture which will not only be lasting but also could represent manifestations of a new fabric tailored to time and place. These principles hidden in sustainable architecture represent lasting and stable principles for human beings (Zarghami, Khaki, and Sadat 2015).

### 3.1. House (Housing)

Housing is a physical structure, a lodging or shelter that homes people and provides them with a place to reside and rest. The Dekhoda Dictionary defines housing to be equivalent to an abode, a place for dwelling, or a place for rest. It is also defined as a shelter, as noted by urban planning concepts (Yaran and Behro 2017). The house reflects social and cultural values and ideologies. The house is described as a place that can meet family needs and expectations (Ebrahimi, Soltanzadeh, and Keramati 2017). It is the first place where man experiences belonging and the only place where human experiences are formed in privacy and in interaction with space (Fathbaghali, Maghsoudi Tilaki, and Hedayati Marzbali 2021). Karimi (2014) argues that what make up the house are its ontological, sustainable, and permanent qualities (Peyvastehgar, Heidari, and Eslami 2017).

According to traditional Iranian architecture, house construction is directly related to traditions, climates, and social and cultural perspectives, as the house symbolizes the hallmark of man and the origin of his traditions. Historical houses in Iran are parts of the golden identity of the people of this land (Jamali and Khandani 2020). Traditional Iranian houses have followed some principles such as using local materials, privacy, flexibility, legibility, introversion, proportions and equilibrium, spatial hierarchy, and respect for the family's privacy (Mirzaei and Luluei 2015).

### 3.2. Culture and Architecture

Culture is a shared and acceptable set of knowledge and values that is underpinned by a specific understanding (Varmaghani, Soltanzadeh and Tahae 2019). For Macionis, culture refers to people's feelings, thinking, and functions, which together make up for lifestyles (Macionis 2009). Rapoport also elaborates on culture, its basics, and how it could influence built environments, defining the lifestyle to be a component of cultural components that influence the system of activities and finally, the selection of qualities of life and the built environment (Rapoport

1998). Presenting definitions of culture components, researcher architects have concentrated more on customs, traditions, social characteristics, popular thoughts and ideologies, and their influences on architecture. Accordingly, as part of an architectural culture, each building is responsible for objectifying subjective thinking by its specific conditions, thereby serving as an epitome to measure culture; hence, each building is said to be a cultural indicator (Memarian 2016).

Culture and built spaces are two closely related concepts that enable man to create meaningful environments with specific and unique identities, which could help describe its elements and characteristics (Ashfina 2014). Baydar (2004) argued that more attention began to be paid to cultural issues in architecture from around four decades ago. He maintained that it was only possible to understand housing by perceiving various layers of cultural influences. Dezuari (2010) suggested that architecture served like human clothes and other means to help him adapt to the environment, and what makes this adaptation possible is culture (Mozafar, Hosseini, and Abdemojiri 2012). For this, Rapoport held that a building may indicate a belief and a significant component of culture. For Rapoport, various factors influence how the house is shaped, including family structures, social systems, lifestyles, religious ideologies, and social relations between people (Rapoport 1998).

Oliver argued that culture is a constituent of architecture, demonstrating that "architecture is an entity with a multi-functional function, rather than a bodily structure influenced by society, culture, religious ideologies, economy, and environmental conditions. While architecture is a cultural indicator, its forms, and configurations are under the influence of culture, which produce architecture as a final product" (Mozafar, Hosseini, and Abdemojiri 2012). According to culture-oriented researchers, culture is a constituting component of architectural space, and such factors as the climate, the environment, and the site, among others, make up the major elements underlying architecture, after culture.

### 3.3. Qajar-Era Architecture and Influence by Modernization and Western Architecture

As the Safavid era began, the ties between Iran and Europe expanded at an even faster pace than in the Qajar era. This was noted by the high rate of travel by Iranians and Europeans, which made Iranians familiar with the scientific and cultural advancements of European states. On the other hand, Qajar kings had concluded that Iran was actually lagging behind other states following its successive defeats at the hands of Russians and British forces. Subsequent changes [in Iran] started along with the European Renaissance and the beginning of the Western society's scientific and technological developments, which influenced other countries, including Iran (Banimasoud 2015). As

widespread developments continued across society, Iranian architects encountered many developments, especially since the dynasty of Naser al-Din Shah who in his travel to Europe became fond of the Western culture, having become more interested in the European royal family, their entertainment, and building architecture (Ghobadian 2014). In fact, modern architecture almost began during the tenure of Naser al-Din Shah, as his fifty-year rule and relatively peaceful governance laid the foundation for prosperity (Sajadi, Rostami, and Rostami 2014).

The Qajar-era architecture can be broadly classified into two periods: the first period started from the tenure of Agha Mohammad Khan the Qajar to the end of Mohammad Shah kingdom-with the dominant architectural style of this period having followed the Isfahani style- and the second period started from the kingdom of Naser al-Din Shah to the end of the Qajar dynasty government-which marked the beginning of an architectural style that combined traditional and Western architecture (Ghobadian 2014).

Traditional Iranian houses had almost retained their main parts in various eras; however, the Qajar era is said to have made significant changes to the shapes, forms, locations, functional structures, and facades of these houses, following the dramatic influence of Western architecture approaches in Iran (Haqjoo et al. 2019). Qajar-era houses were generally a combination of Iranian and European architecture and consisted of spaces such as two-way stairways along the main buildings' axes, extended plans along the buildings, iwans with two symmetrical columns facing them, a central room and smaller ones situated around it in simple and detail forms, diverse stylistics and spatial openness, expansive perspectives formed by windows, the conversion of Se-Dari to Do-Dari, direct sunlight into the buildings, the placement of a pond (Howzkhaneh), and the use of sloped columns and gable roofs (Sadeghi, Ekhlasi, and Kamelnia 2019).

The Qajar era saw residential buildings use specific principles of designs, techniques, and implementation, as residential building designs involved the separation of interior and exterior spaces, giving an attractively charming view of the buildings (Zomorshidi 2011). Meanwhile, designing house entrance spaces as conjoining the public passageway space to the house's private area could significantly characterize the cultural values of its occupants. Also, the manner and styles of designing the doorstep describes a hierarchy of linking and protection for the residents of the house against others. House fabric designs actually featured environmental, cultural, social, and economic properties (Varmaghani, Soltanzadeh, and Tahae 2019). Buildings of this period aimed at meeting the intrinsic needs of residents were characterized by religious and moral ideologies, technical, administrative, and privacy principles, among others (Zomorshidi 2011).

### 3.4. Kermanshah Houses Architecture

The old Kermanshah architecture followed the general principles of central Iranian architecture. In the beginning of the Qajar era, the spatial architectural structure of Kermanshah houses was commonly introvert, though it saw a more integrative style with the introduction of Western architectural patterns by the late Qajar era, having been represented in state and noble houses (Boroumand Sorkhabi 2009).

Spaces composing introvert houses featured cultural, climatic, and functional aspects, and were characterized by certain order and centrality around interior and exterior courtyards. In Kermanshah's historical houses, the physical structure of an introvert pattern consisted of the entrance space (e.g., alleys, forecourts, doors, and vestibules), the main spaces (e.g., halls, rooms around the interior, columned covered iwans, and arcades), linking spaces (e.g., interior and exterior courtyards, vestibules, halls, and stairways), service spaces (kitchens, WCs, bathrooms, closets, and service member rooms), and the basement. The physical introvert-extrovert structure of Qajar-era houses consisted of the entrance space (e.g., streets, doors, entrance halls), the main spaces (central halls, rooms in rows, and columned covered balconies), linking spaces (entrance halls, corridors, interior courtyards, and stairways), and service spaces (kitchens, WCs, bathrooms, storehouses, and service member spaces), and the basement, usually seen on the building's façade (Boroumand Sorkhabi 2009).

## 4. METHODOLOGY

This study aimed to analyze the influences of cultural factors, modernization, and Western architectural patterns on Qajar-era Kermanshah Houses. This study had a developmental goal and fell under qualitative-quantitative research from a methodological point of view. This study selected 10 Kermanshah Houses dating back to the Qajar era, which included the Feiz Mahdavi House, the Moein al-Ketab House, the Khaje Baroukh House, the Samadi House, the Sarem al-Dolah House, the Hakim Nasir House, the Sa'dvandi House, the Mo'tazed al-Dolah House, the Gol Anbar House, the Seyedein House, the Souri House, and the Alaei House. These examples were selected from the Iran National Heritage List for their artistic and architectural values. The statistical population of this study consisted of experts, including academic professors and faculty members of top universities, as well as experts at the General Department of the Cultural Heritage Organization. The statistical population was selected based on theoretical adequacy and saturation for as long as components mentioned by experts become repetitive and reach a theoretical saturation limit. The statistical population involved 18 subjects, as the theoretical saturation limit was reached after the 11th subject was interviewed.

In the literature review section of the study, tools for collecting data included library sources, while in the second section, semi-structured interviews with experts were used to develop and extract the factors and criteria intended. To examine and finalize the available indicators in detail, the thematic analysis technique and the fuzzy Delphi method were used to design a conceptual model in line with the consensus of experts. Hence, based on the extracted factors and criteria and to finally separate the components of the

model designed, questionnaires were developed and sent to the experts. The experts assigned scores to the factors and criteria and selected relevant components. In general, two types of questionnaires were used in this study: the first one was validated by the fuzzy Delphi method to refine the components affecting residential spaces, whereas the second was applied to weigh the components and finally, select the more important components. The study procedure is illustrated in Figure 1 below.

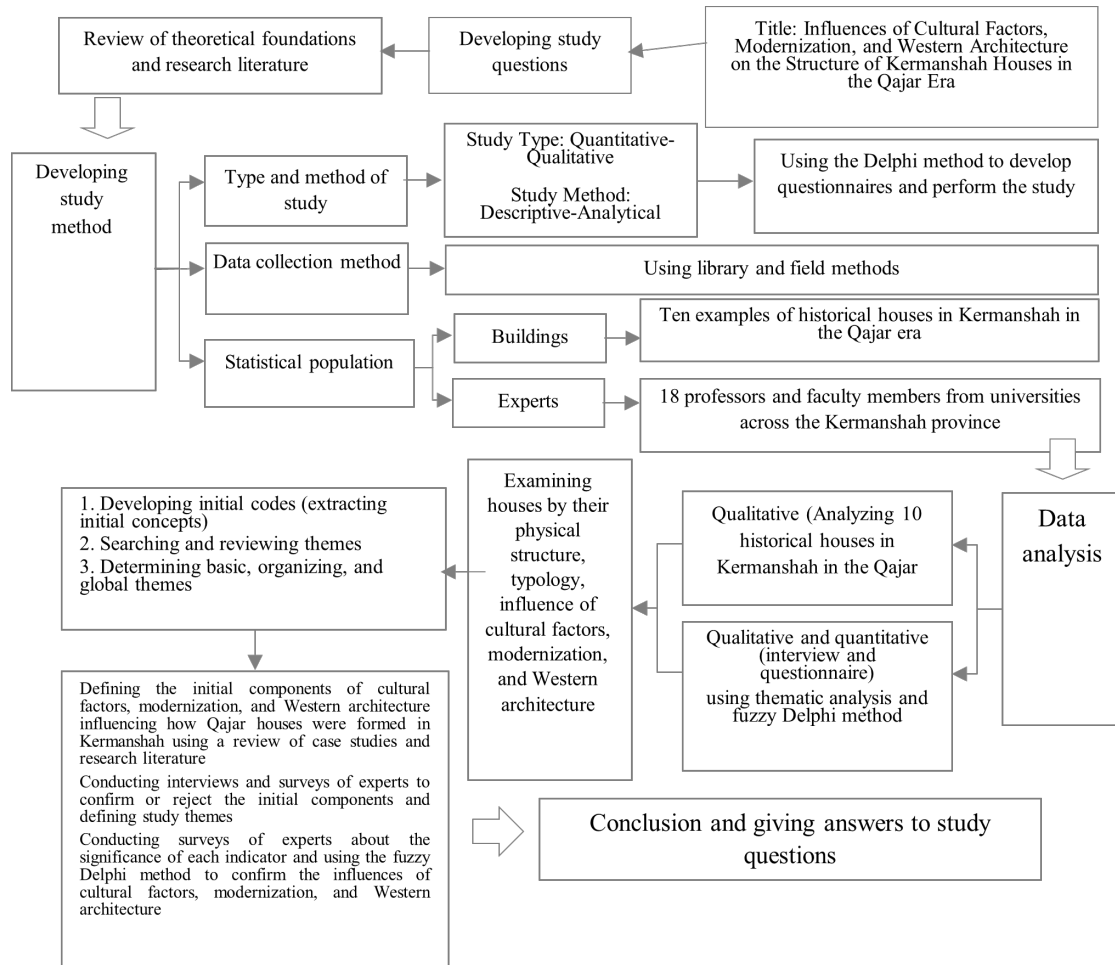


Fig. 1. Study Procedure

## 5. DATA ANALYSIS AND FINDINGS

This section first qualitatively analyzes ten examples of Kermanshah's historical houses that date back to the Qajar era to determine their architectural and physical characteristics and how they have been influenced by cultural factors, modernization, and Western architectural styles. Then, the data obtained from the literature review and the qualitative studies on the historical houses are used to determine the primary data and indicators. To analyze the data collected from the qualitative and interview techniques, various indicators and characteristics are

identified and examined by factor analysis. To analyze the qualitative data, the thematic analysis method is used, as the network of themes method, a subset of various thematic analysis methods, is used to better demonstrate the correlation between the themes. Also, to collect data, the interview method is used in addition to theoretical foundations. The interviews are recorded and relevant codes and categories are extracted. At last, data are categorized.

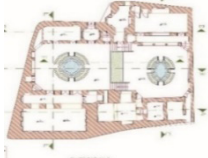

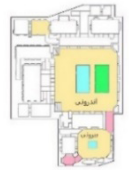
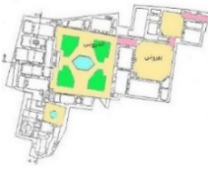


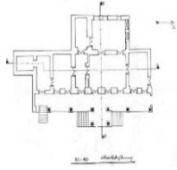
### 5.1. Analyzing Case Studies

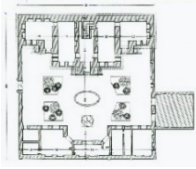

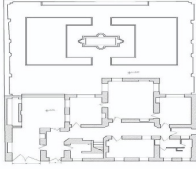
This study selected and qualitatively examined 10 Kermanshah Houses dating back to the Qajar era,

which included the Feiz Mahdavi House, the Moein al-Ketab House, the Khaje Baroukh House, the Samadi House, the Sarem al-Dolah House, the Hakim Nasir House, the Sa'dvandi House, the Mo'tazed al-Dolah House, the Gol Anbar House, the Seyedein House, the Souri House, and the Alaei House.

A review of Qajar-era houses indicated that they were quite compatible with environmental conditions and cultural characteristics, and were influenced by such factors as climatic and cultural characteristics, traditional architecture, modernization, and Western architecture (Table 1).

**Table 1. Introducing and Analyzing Case Studies by the Influences of Shared Characteristics, Cultural Factors, Modernization, and Western Architecture**

| Houses                             | Type of Plan/<br>No. of Floors     | Ground Floor Plan   | Shared Characteristics  | Influences of Cultural Factors and Traditional Architecture                       | Influences of Modernization and Western Architecture  |
|------------------------------------|------------------------------------|---|---|---|---|
| Feiz Mahdavi House                 | Introvert Two-Story and a Basement |    | Decorative brickwork on arches and vaults, plasterwork, columned iwans, ponds, and gardens        | Entrance hierarchy, privacy, interior and exterior separation, using split levels | Gable roofs, Corinthian capitals, projected balconies   |
| Moein al-Ketab House (Moshahshaei) | Introvert Two-Story and a Basement |    | Decorative vaults, Moaqali'-work on gusset plates and frontispieces and doors, ponds, and gardens | Entrance hierarchy, privacy, interior and exterior separation                     | -   |
| Khaje Baroukh House (Randehekesh)  | Introvert Two-Story                |  | Brickwork, Moaqali tilework, using clay, gardens, and ponds                                       | Entrance hierarchy, introversion, interior and exterior                           | Use of labyrinth arches, Patupa/mixed arch, and arched vaults                                   |
| Samadi House                       | Introvert Two-Story                |  | Columned iwans (porches), wooden and brick decoration, plasterwork, gardens and ponds             | Entrance hierarchy, introversion, interior and exterior                           | Wall paintings, two-way central stairway, Centauri, Western decorations, Corinthian capitals    |
| Hakim Nasir House                  | Introvert Two-Story                |  | Columned iwans, Moaqali work, brickwork, gardens and ponds  | Entrance hierarchy, introversion, privacy   | -   |
| Sa'dvandi House                    | Introvert Two-Story and a Basement |  | Orosi <sup>2</sup> , plasterwork, tilework, decorative brickwork, wooden decorations              | Entrance hierarchy, introversion, privacy   | -   |
| Gol Anbar House                    | Introvert-Extrovert Single Story   |  | Columned iwans, colorful plasterwork, brickwork, and tilework                                     | Brick Muqarnas  | Two-way central stairway, gable roofs, Western capitals, Western decorations, extensive gardens |

| Houses         | Type of Plan/<br>No. of Floors                            | Ground Floor Plan   | Shared Characteristics   | Influences of Cultural<br>Factors and Traditional<br>Architecture | Influences of<br>Modernization and<br>Western Architecture                            |
|----------------|---|---|--|---|---|
| Seyedein House | Introvert-<br>Extrovert<br>Two-Story<br>and a<br>Basement |  | Nice plasterwork,<br>window framing,<br>gardens, and ponds     | -   | Gable roofs, two-way<br>entrance stairway, ionic<br>and pseudo-Corinthian<br>capitals |
| Jalili House   | Introvert-<br>Extrovert<br>Two-Story                      |  | Columned iwans,<br>decorative brickwork,<br>ponds, and gardens | Interior and exterior<br>separation, Privacy                      | Gable roof, extrovert<br>façade   |
| Alaei House    | Introvert-<br>Extrovert<br>Two-Story<br>and a<br>Basement |  | Brickwork and<br>plasterwork, gardens,<br>and ponds            | -   | Columned iwan,<br>balcony, gable roof,<br>extensive gardens,<br>extrovert features    |

The majority of these houses are characterized by introversion, privacy, entrance hierarchy plasterwork decorations, and Moaqali and brickwork, which are

inspired by traditional architecture and local culture (Table 2).

**Table 2. Influences of Cultural Characteristics and Traditional Architecture on Qajar-Era Kermanshah Houses**




| Houses          | Images   | Plans  | Indicators of Cultural Factors<br>and Traditional Architecture   |
|-----------------|--|--|--|
| Sa'dvandi House | <br> |  | Designing a hierarchy of<br>entrance (pishtaq <sup>3</sup> and the<br>vestibule), introversion<br>and privacy, Orosi and Se-<br>Dari, plaster decorations,<br>Moaqali, and brickwork             |
| Samadi House    | <br> |  | Designing a hierarchy of<br>entrance (Pishtaq and the<br>vestibule, and the corridor),<br>introversion and privacy, the<br>separation of private, and<br>guest spaces (interior and<br>exterior) |



| Houses                            | Images  | Plans  | Indicators of Cultural Factors and Traditional Architecture   |
|-----------------------------------|---|--|---|
| Mocin al-Ketab House              |    | <br>View of the ground floor | Designing a hierarchy of entrance (Pishtaq and the vestibule, and the corridor), introversion and privacy, the separation of private, and guest spaces (interior and exterior), plasterwork decorations, Moaqali, brickwork |
| Khaje Baroukh House (Randeh-Kesh) |   |                             | Designing a hierarchy of entrance (Pishtaq and the vestibule, and the corridor), introversion and privacy, the separation of private and guest spaces (interior and exterior), plasterwork decorations, Moaqali, brickwork  |
| Hakim Nasir House                 |  |                            | Designing a hierarchy of entrance (Pishtaq and the vestibule, and the corridor), introversion and privacy, the separation of private and guest spaces (interior and exterior), plasterwork decorations, Moaqali, brickwork  |

Some other houses that mainly belong to the late Qajar era are characterized by Westernization, paintings, Western decorations, extroversion, broken skylines, Centauri features, gable roofs, two-way

entrance stairways, Western columns and capitals, and buildings' projected frontispiece, etc., which are inspired by Western architecture and are incorporated into traditional Iranian architecture.

**Table 3. Influences of Modernization and Western Architecture on Qajar-era Kermanshah Houses**

| Houses         | Images  | Indicators of Modernization and Western Architecture   |
|----------------|---|--|
| Seyedein House | <br><br> | Columned Iwans (Shared Features)<br>Gable Roofs<br>Iwan-Like Capitals<br>Western Decorations<br>Two-Way Entrance Stairways |

| Houses             | Images  | Indicators of Modernization and Western Architecture  |
|--------------------|---|---|
| Feiz Mahdavi House |    | <ul style="list-style-type: none"> <li>Columned Iwans (Shared Feature)</li> <li>Gable Roofs</li> <li>Corinthian Capitals</li> <li>Projected Balcony</li> </ul>  |
| Alaei House        |    | <ul style="list-style-type: none"> <li>Columned Iwans (Shared Features)</li> <li>Gable Roofs</li> <li>Main Facades with Extroversion Features</li> <li>Extensive Gardens</li> </ul>                                       |
| Gol Anbar House    |   | <ul style="list-style-type: none"> <li>Columned Iwans (Shared Features)</li> <li>Gable Roofs</li> <li>Two-Way Entrance Stairways</li> <li>Extroversion</li> <li>Western Decorations</li> <li>Extensive Gardens</li> </ul> |
| Jalili House       |  | <ul style="list-style-type: none"> <li>Columned Iwans (Shared Features)</li> <li>Gable Roofs</li> <li>The Main Façade with Extroversion Features</li> </ul>   |

To meet its goals, this study aimed to explore the characteristics shared by Qajar-era houses in Kermanshah and to investigate the influences of cultural and lifestyle characteristics, modernization, and Western architecture on these houses. As noted in the examples, the majority of the houses feature introversion, privacy, entrance hierarchy, plasterwork decorations, Moaqali-work, and brickwork, which follow local culture and religious ideologies. Other houses, belonging to the late Qajar era, also featured Westernization, paintings, Western decorations, extroversion, broken skylines, Centauri features, gable roofs, two-way entrance stairways, Western columns and capitals, buildings' projected frontispiece, etc., which are inspired by Western architecture and are incorporated into traditional Iranian architecture.

## 5.2. Identifying Final Components of Cultural Factors, Modernization, and Western Architecture Influencing the Formation of Kermanshah Houses

This section lists the major concepts and indicators obtained from the literature review and the process of interviewing experts concerning the final components of cultural factors, modernization, and Western architecture influencing the formation of Qajar-era Kermanshah houses. Here, upon a more accurate analysis, the key indicators extracted are first listed and standardized (shared components are removed and more correct terms are selected). As many as 76 primary items are obtained in this section. At this stage, the relationship between the

main themes and others is determined and the main and secondary components are related together to help collect theoretical concepts in order to identify the final components of the factors influencing the formation of Qajar-era house architecture structures. This is performed by emphasizing cultural factors, modernization, and Western architecture. Finally, the concepts and themes, obtained in the prior stage, are meticulously analyzed and integrated and are used to provide a network of themes. After identifying the components influencing the

model, a questionnaire was developed to collect expert opinions. Experts, meanwhile, were asked to assign scores upon their agreement from 1 to 3 to influential components (based on the categories) on a fuzzy spectrum and to add to the list provided, if necessary, more examples. They were also required to provide explanations for their possible disagreements with evaluation criteria. In sum, the score of 3 was considered the basis criterion, thus excluding the components scored under 3. As many as 15 factors were finally extracted into three categories (Table 4).

**Table 4. Final Components of Cultural Factors, Modernization, and Western Architecture Influencing the Formation of Kermanshah Houses**

| No. | Global Themes                          | Components (Organizing Themes)   |
|-----|--|--|
| 1   | Shared Features                        | The entrance set (the Pishtaq, corridor, vestibule, doorway)   |
| 2   |  | The courtyard (the interior, exterior, privacy), the garden, water ponds, iwan, and hall   |
| 3   |  | The Orosi window, pond, Jaam-Khane   |
| 4   |  | The clay or brick façade with high and simple walls without apertures  |
| 5   |  | Plasterwork, decorative brickwork, tilework, wooden decorations  |
| 6   |  | Using regular plans (square and square-rectangular)  |
| 7   |  | Elevated ante-entrance and public spaces compared to private spaces  |
| 8   | Modernization and Western Architecture | Adhering to Western-style houses (extrovert and stairway-oriented)   |
| 9   |  | English and British landscaping (extensive lawn campuses)  |
| 10  |  | Metal sloped rooftops  |
| 11  |  | Western architecture-inspired projected frontispiece, using Western columns and capitals, clay and seven-color tiles, decorative brickwork |
| 12  |  | Outdated Zigzag patterns (using semi-circle arches across the door, iwans, and niches)   |
| 13  | Cultural Factors                       | Utilizing traditional architectural concepts   |
| 14  |  | Westernization styles  |
| 15  |  | Presence of Western lifestyles and means   |

### 5.3. Identification and Final Examination of Model Components

After identifying the final components, a list of 15 confirmed components of cultural factors, modernization, and Western architecture that influenced the formation of Qajar-era Kermanshah houses was provided in the form of a questionnaire. In

this stage, the experts were required to provide their opinions about the significance of the dimensions and criteria influencing the subject under study by assigning scores from “very low (1)” to “very high (5)”. Table 5 below gives the statistics of the expert opinions in the first round by the number of opinions for each of the dimensions or criteria.

**Table 5. Scoring Criteria by Experts**

| No. | Global Themes   | Components   | Very Low | Low | Medium | High | Very High |
|-----|-----------------|--|----------|-----|--------|------|-----------|
| 1   | Shared Features | The entrance set (the Pishtaq, corridor, vestibule, doorway)                             | 2        | 2   | 2      | 1    | 1         |
| 2   |                 | The courtyard (the interior, exterior, privacy), the garden, water ponds, iwan, and hall | 0        | 0   | 3      | 3    | 2         |
| 3   |                 | The Orosi window, ponds, Jaam-Khane  | 1        | 2   | 2      | 3    | 0         |
| 4   |                 | The clay or brick façade with high and simple walls without apertures                    | 0        | 0   | 3      | 3    | 2         |

| No. | Global Themes                          | Components   | Very Low | Low | Medium | High | Very High |
|-----|--|--|----------|-----|--------|------|-----------|
| 5   | Shared Features                        | Plasterwork, decorative brickwork, tilework, wooden decorations  | 0        | 0   | 1      | 4    | 2         |
| 6   |  | Using regular plans (square and square-rectangular)  | 0        | 0   | 3      | 3    | 2         |
| 7   |  | Elevated ante-entrance and public spaces compared to private spaces  | 1        | 1   | 0      | 4    | 2         |
| 8   | Modernization and Western Architecture | Adhering to Western-style houses (extrovert and stairway-oriented)   | 1        | 3   | 2      | 2    | 0         |
| 9   |  | English and British landscaping (extensive lawn campuses)  | 0        | 3   | 5      | 0    | 0         |
| 10  |  | Metal sloped rooftops  | 0        | 1   | 2      | 3    | 2         |
| 11  |  | Western architecture-inspired projected frontispiece, using Western columns and capitals, clay and seven-color tiles, decorative brickwork | 0        | 0   | 4      | 1    | 3         |
| 12  |  | Outdated Zigzag patterns (using semi-circle arches across the door, iwans, and niches)   | 1        | 0   | 3      | 2    | 2         |
| 13  | Cultural Factors                       | Utilizing traditional architectural concepts   | 0        | 0   | 3      | 3    | 2         |
| 14  |  | Westernization styles  | 1        | 2   | 2      | 3    | 0         |
| 15  |  | Presence of Western lifestyles and means   | 1        | 1   | 0      | 4    | 2         |

#### 5.4. Response Fuzzification

After collecting the experts' responses that had led to some specific levels for each of the indicators

and criteria based on linguistic variables (very high, high, medium, very low, and low), their numerical values were defined in fuzzy numbers, in the form of triangular fuzzy numbers (Table 6).

**Table 6. Fuzzy Numbers Equivalent to Linguistic Variables**

| Linguistic Variables | Very High      | High          | Medium       | Low          | Very Low     |
|----------------------|----------------|---------------|--------------|--------------|--------------|
| Fuzzy Numbers        | (5, 7, 10, 10) | (5, 7, 7, 10) | (2, 5, 5, 7) | (0, 2, 2, 5) | (0, 0, 2, 5) |

After converting the experts' linguistic responses into fuzzy numbers, the average fuzzy [number] of each item was calculated based on the relevant formulas. Then, the calculated averages were used to calculate

the de-fuzzy number of each of the indicators and criteria based on the experts' questionnaire data (Table 7).

**Table 7. Averaging Fuzzy Scores**

| No. | Global Themes   | Components   | Fuzzy Scores |     |     | Averages |
|-----|-----------------|--|--------------|-----|-----|----------|
| 1   | Shared Features | The entrance set (the Pishtaq, corridor, vestibule, doorway)                             | 8.8          | 5.6 | 6.2 | 6.87     |
| 2   |                 | The courtyard (the interior, exterior, privacy), the garden, water ponds, iwan, and hall | 7.7          | 10  | 6.9 | 8.20     |
| 3   |                 | The Orosi window, ponds, Jaam-Khane  | 8.4          | 5.9 | 6.7 | 7        |
| 4   |                 | The clay or brick façade with high and simple walls without apertures                    | 6.8          | 8.6 | 4.5 | 6.63     |
| 5   |                 | Plasterwork, decorative brickwork, tilework, wooden decorations                          | 5.9          | 8.6 | 7   | 7.17     |
| 6   |                 | Using regular plans (square and square-rectangular)                                      | 8.4          | 9.5 | 6.2 | 8.03     |
| 7   |                 | Elevated ante-entrance and public spaces compared to private spaces                      | 7.8          | 9.1 | 5.8 | 7.57     |

| No. | Global Themes                          | Components   | Fuzzy Scores |     |     | Averages |
|-----|--|--|--------------|-----|-----|----------|
| 8   | Modernization and Western Architecture | Adhering to Western-style houses (extrovert and stairway-oriented)   | 9.5          | 6   | 8.7 | 8.07     |
| 9   |  | English and British landscaping (extensive lawn campuses)  | 5.6          | 3.3 | 10  | 6.5      |
| 10  |  | Metal sloped rooftops  | 5.2          | 8.1 | 5   | 6.10     |
| 11  |  | Western architecture-inspired projected frontispiece, using Western columns and capitals, clay and seven-color tiles, decorative brickwork | 6.1          | 7.5 | 7   | 6.87     |
| 12  |  | Outdated Zigzag patterns (using semi-circle arches across the door, iwans, and niches)   | 4.5          | 8.2 | 6.1 | 6.27     |
| 13  | Cultural Factors                       | Utilizing traditional architectural concepts   | 8.4          | 9.5 | 6.7 | 8.20     |
| 14  |  | Westernization styles  | 8.1          | 5   | 4.1 | 5.73     |
| 15  |  | Presence of Western lifestyles and means   | 6.3          | 5.4 | 7.2 | 6.3      |

### 5.5. Confirming the Proposed Evaluating Framework

As a threshold number in the fuzzy method must be determined to reject or confirm the components under evaluation, this study considered the number 3 as the threshold. Fortunately, none of the themes were eliminated and the necessary scores were assigned to the components, as suggested by the experts.

### 5.6. Extracting the Final Model of Basic, Organizing, and Global Themes

To extract the final model of the study's network of themes (basic, organizing, and global themes), key

components and factors were determined following the field survey, reviewing the literature, and conducting the interviews. Next, after reviewing the components, organizing and global themes were extracted. The network of themes consisted of 15 components (organizing themes), which were incorporated into three main global themes (shared features, modernization and Western architecture, and cultural factors). As noted in the diagram below, the network of themes incorporates global and organizing themes (Fig. 2).

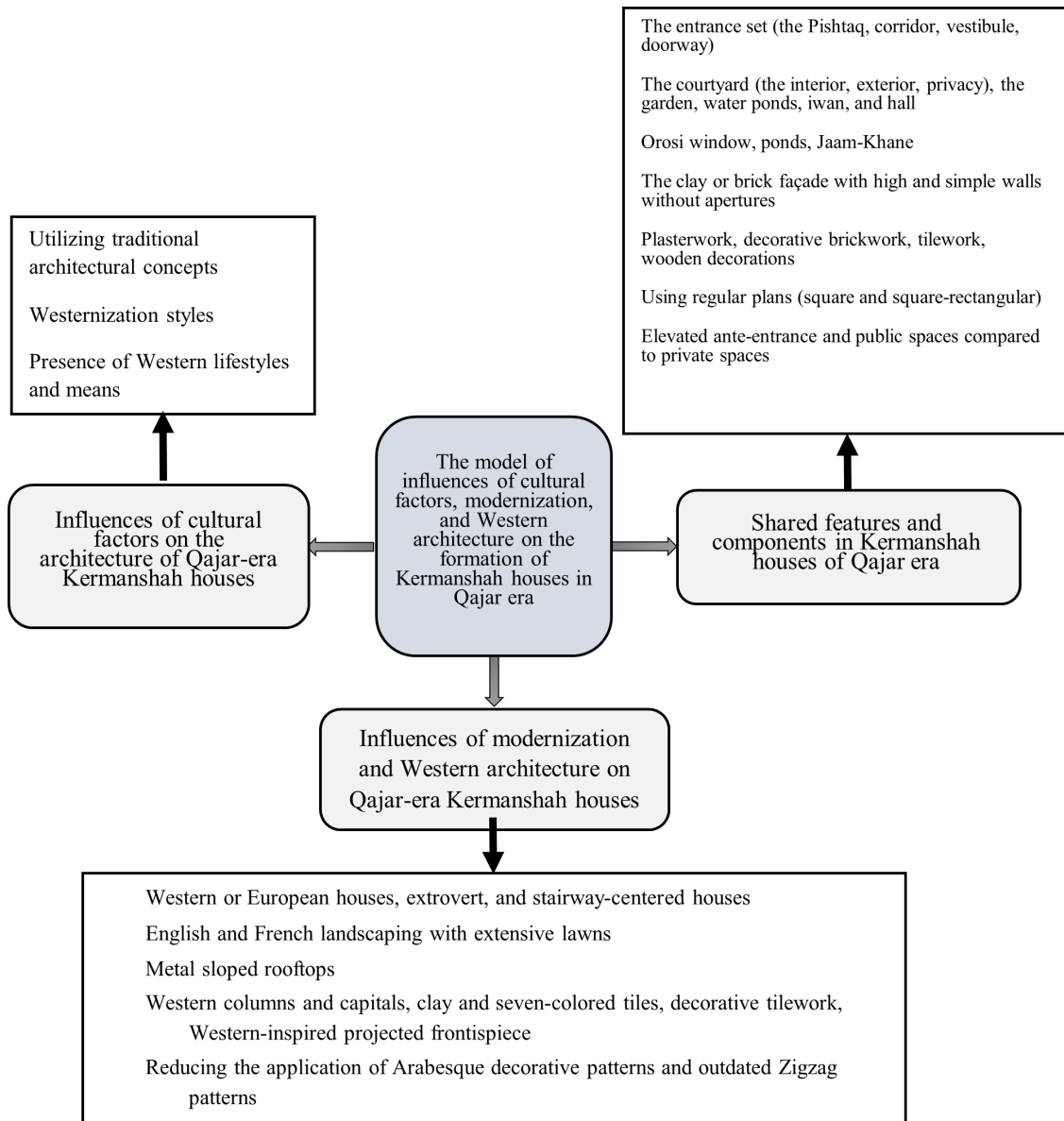


Fig. 2. Network of Themes

After extracting the conceptual model and the study's network of themes and determining the 15 organizing themes that were noted in the Qajar-era Kermanshah Houses under the influence of shared architectural

features, cultural factors, modernization, and Western architecture, the following table gives each of the themes in the studied houses (Table 8).

**Table 8. Influences of the Fifteen Components of the Network of Themes (Shared Features, Cultural Factors, Modernization, and Western Architecture) in Qajar-era Kermanshah Houses**

| Global Themes  | Organizing Themes  | Global Themes      |                      |                     |              |                   |                  |                 |                |              |             |   |
|--|--|--------------------|----------------------|---------------------|--------------|-------------------|------------------|-----------------|----------------|--------------|-------------|---|
|  |  | Feiz Mahdavi House | Moein Al-Ketab House | Khaje Baroukh House | Samadi House | Hakim Nasir House | Sa' dvandi House | Gol Anbar House | Seyedein House | Jalili House | Alaei House |   |
| Shared Components in the Architecture of Qajar-era Kermanshah Houses | The entrance set (the Pishtaq, corridor, vestibule, doorway)   | *                  | *                    | *                   | *            | *                 | *                | *               | -              | -            | *           | - |
|  | The courtyard (the interior, exterior, privacy), the garden, water ponds, iwan, and hall   | *                  | *                    | *                   | *            | *                 | *                | *               | -              | -            | *           | - |
|  | The Orosi window, ponds, Jaam-Khane  | *                  | *                    | -                   | *            | *                 | *                | *               | -              | -            | -           | - |
|  | The clay or brick façade with high and simple walls without apertures  | *                  | *                    | *                   | -            | *                 | *                | *               | *              | -            | -           | - |
|  | Plasterwork, decorative brickwork, tilework, wooden decorations  | *                  | *                    | *                   | *            | *                 | *                | *               | *              | *            | *           | * |
|  | Using regular plans (square and square-rectangular)  | *                  | *                    | *                   | *            | *                 | *                | *               | *              | *            | *           | * |
|  | Elevated ante-entrance and public spaces compared to private spaces  | *                  | *                    | -                   | *            | *                 | *                | *               | -              | *            | -           | - |
| Influences of Modernization and Western Architecture                 | Adhering to Western-style houses (extrovert and stairway-oriented)   | -                  | -                    | -                   | *            | -                 | -                | *               | *              | *            | *           |   |
|  | English and British landscaping (extensive lawn campuses)  | -                  | -                    | -                   | *            | -                 | -                | *               | *              | *            | *           |   |
|  | Metal sloped rooftops  | *                  | -                    | -                   | *            | -                 | -                | *               | *              | *            | *           |   |
|  | Western architecture-inspired projected frontispiece, using Western columns and capitals, clay and seven-color tiles, decorative brickwork | *                  | -                    | -                   | *            | -                 | -                | *               | *              | *            | *           |   |
|  | Outdated Zigzag patterns (using semi-circle arches across the door, iwans, and niches)   | *                  | -                    | *                   | *            | -                 | -                | *               | *              | *            | *           |   |
| Influences of Cultural Factors                                       | Utilizing traditional architectural concepts   | *                  | *                    | *                   | *            | *                 | *                | *               | -              | -            | *           | - |
|  | Westernization styles  | *                  | -                    | -                   | *            | -                 | -                | *               | *              | *            | *           |   |
|  | Presence of Western lifestyles and means   | *                  | -                    | -                   | *            | -                 | -                | *               | *              | *            | *           |   |

## 6. CONCLUSION

Traditional Iranian houses featured sustainable patterns and were characterized by spaces around courtyards, a hierarchy of accessibility, open, semi-open, and closed spaces. This spatial layout aimed to provide residents of houses with comfort. As stated earlier, the houses featured indirect entrances, as the private and public sections of the houses were separated from each other. Also, the houses' interior sections involved green spaces, natural elements, gardens and ponds, with the mental and physical

needs of the houses having been met. Most of the time, central courtyards, serving as the interior sections and smaller courtyards (Narenjestani), were used for capturing light and protecting the houses' privacy, as separate entrances were considered for men and women.

This study explored the role of cultural factors, modernization, and Western architecture on the structures of historical Qajar-era houses in Kermanshah. Qualitative and quantitative findings revealed that all three categories of shared architectural features, cultural factors, modernization, and Western

architecture were effective in the formation of Qajar houses, representing various components of Qajar-era architecture and houses of this era.

Detailed surveys have indicated that cultural features were effective in the formation of the structure of Kermanshah's Qajar-era house architecture. The components of these features included utilizing traditional architectural concepts, Westernization styles, and Western lifestyles. In this era, elements of local and Iranian culture and architecture could be seen in the houses, despite the influence of Western culture and architecture. However, houses of common people were constructed using traditional architectural principles, and Western cultural influences could only be seen in noble and luxury palaces and houses. These decorations were mostly seen in the construction and furniture, whereas the houses' spatial layout was more or less affected by local culture and traditional architecture, and they were characterized by local materials, central courtyards, entrance hierarchies, privacy, and the separation of private and public spaces. Meanwhile, Western architecture and modernization were reflected in the structures of Qajar-era houses in Kermanshah. In this connection, Western or European style-inspired and extrovert and stairway-centered houses featuring English and French landscaping (using lawns), metal sloped rooftops, outstanding frontispiece, Western columns and capitals, decorative brickwork, and reduced use of Arabesque and geometric decorative patterns were identified.

### 6.1. Answering the Questions

*First Question: What were the features shared by Kermanshah City's Qajar-era houses?*

In this connection, seven features were realized to be the shared components of the houses. They were the set of the entrance section (Pishtaq, corridors, vestibules, and doorways), the courtyard (the interior, the exterior, and privacy), and gardens, ponds, iwans, halls, Orosi, Jaam Khaneh, clay- or brick-made façades, plasterwork, square and square-rectangular plans, and the separation of private and public spaces.

*Second Question: How did modernization and Western architecture influence Kermanshah City's housing architecture?*

In this connection, relevant features were extrovert and stairway-centered houses involving English and French landscaping (lawns), metal sloped rooftops, outstanding frontispiece, Western columns and capitals, clay and seven-color tiles, decorative brickwork, reduced use of Arabesque and geometric patterns, and the outdated zigzag patterns.

In this era, architecture underwent an unprecedented cessation, facing unfamiliar and heterogeneous elements. It was during this era that a new architectural technique formed in Iranian architecture, leading architects to incorporate Iranian architecture into Western architecture. Meanwhile, modernist measures

to align Iranian and Western cultures helped design Qajar-era buildings that would combine traditional Iranian and imported Western elements. Following new social and cultural innovations and modern developments, local designers and architects began to gradually adopt this style and took it into account in their works. Because this era represented a challenge between traditionality and modernity in architecture, column and capital patterns, entrance and portal patterns, as well as gable rooftops, windows, and volumetric forms of Kermanshah houses, among others, featured what would be referred to as Western architecture and modernization effects.

*Third Question: How did cultural factors shape the Kermanshah City's Qajar-era housing architecture?*

In this connection, relevant features were using traditional architecture concepts, Westernization styles, and the presence of Western lifestyles.

Western-inspired construction began for the first time since the Qajar era and after the Constitutional Revolution. At that time, Qajar kings took the first step in this course by importing Western culture and incorporating it into house construction. International construction styles have influenced national construction styles, without having regard for local climatic conditions and specific cultural indicators. For this, Western culture-inspired influences in Qajar era houses consisted of elements not yet adopted in the Iranian culture and society. In sum, it should be pointed out that Qajar-era houses in Kermanshah were mainly represented by changing furniture styles in these houses.

### 6.2. Recommendations

According to the findings, the following is recommended:

- a. New house designs are recommended to include such concepts as observing an entrance hierarchy, privacy, the separation of private and public spaces, the creation of open, semi-open, and closed spaces;
  - b. Green spaces in backyards, gardens on rooftops, and sustainable central courtyards are also recommended;
  - c. Local culture and traditions are recommended to be included in the form and content of residential use architecture;
  - d. The introduction of Western architectural styles and components incompatible with local architecture are recommended to be avoided, and
  - e. The historical texture of Kermanshah City is recommended to involve local culture and architecture by developing urban rules and regulations.
- To generalize the findings, the following is recommended for prospective research:
- a. Conducting a comparative study between residential, industrial, and administrative buildings dating back to the Qajar era from the perspective of the factors mentioned in the study;
  - b. Investigating the forms, content, typologies, and architectural features of Qajar-era houses in the city

of Kermanshah;  
c. Conducting a comparative study between lifestyle changes and their impacts on architectural fabrics of Qajar-era houses, and

d. Evaluating the elements of color, geometry, forms and shapes, and decorations of Qajar-era houses before and after the introduction of modernization and Western architecture

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## CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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The authors commit to observe all the ethical principles of the publication of the scientific work based on the ethical principles of COPE. In case of any violation of the ethical principles, even after the publication of the article, they give the journal the right to delete the article and follow up on the matter.

## PARTICIPATION PERCENTAGE

The authors state that they have directly participated in the stages of conducting research and writing the article.

## ENDNOTE

1. Moaqali tile is a type of tile decorated with Kufic masonry lines, the decorative use of which can be seen across various surfaces.
2. An Orosi is actually a lattice window
3. Central Portal

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