

Original Research Article

A Typology of Semi-Open Spaces in the Historical Houses of Ardakan (A Comparative Study of the Safavid and Qajar Periods)

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Abstract

Problem statement: Vernacular architecture in each region takes shape in response to the needs of its users and in harmony with the climate, geography, and culture of that society. Ardakan is one of Iran's historical cities, and distinctive architectural features were developed in response to local conditions. The presence of a central courtyard in appropriate conjunction with semi-open and enclosed spaces is one of the architectural characteristics of this region, in alignment with the climatic and geographical conditions of the desert area. Semi-open spaces are among the important elements in the architecture of this region and the identity of these historical houses. Despite the significance of semi-open spaces in the historical houses of Ardakan, no independent research has yet been conducted to identify and classify these spaces for potential use in the contemporary architecture of the region.

Research objective: The aim of this article is to conduct a typological study of semi-open spaces in the historical houses of Ardakan during the transition from the Safavid to the Qajar period

Research method: The methodology of this study is descriptive-analytical, and data analysis was conducted with data collected through both fieldwork and documentary research. The sample included six houses from the Safavid period and six houses from the Qajar period, which were purposively selected based on factors such as accessibility, the possibility of on-site visits and field research, validation by heritage experts, minimal alterations, and preservation of authenticity. The data were ultimately analyzed qualitatively.

Conclusion: The findings of the study reveal that semi-open spaces in these houses fall into three main types: semi-open living spaces (talar), semi-open living–passage spaces with shallow depth (iwan), and passage-oriented semi-open spaces. Each of these spatial types includes subcategories within itself. The analysis indicates that, throughout the two periods, the courtyard area decreased while the area allocated to semi-open spaces increased. Among the semi-open spaces, the semi-open living spaces occupy approximately 5% of the total area in Safavid houses and about 6% in Qajar houses. Despite their relatively small size, these semi-open spaces play a crucial role in defining the identity of Ardakan's historical houses.

Keywords: *Historical houses, Semi-open spaces, Safavid, Qajar, Ardakan.*

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Introduction

Vernacular architecture in different regions reflects the reciprocal relationship and interconnectedness between culture and the environment, as well as their mutual influences. In traditional Iranian architecture, open and semi-open spaces have played a key role. The courtyard, as a central and shared space in traditional Iranian houses, served as a place for natural lighting and ventilation, the creation of greenery, and connection with nature. It was also a space for social interaction among residents and the hosting of family ceremonies. Semi-open spaces such as the iwan have also held special significance in traditional Iranian architecture, often used for rest and enjoying natural landscapes (Abdollahi Mollai & Javan Forozandeh, 2021).

Semi-open spaces in historical houses are recognized as key elements in the design and structure of these buildings. These spaces, which include iwans and semi-open corridors, play a vital role in linking the interior and exterior environments. This connection not only aids in providing natural light and proper ventilation but also allows residents to benefit from the surrounding nature. The role of semi-open spaces in ensuring privacy is also highly significant. These spaces allow inhabitants to maintain their privacy while still engaging with the outdoors. For example, iwans in traditional Iranian houses are designed in such a way that residents can enjoy natural views while remaining hidden from the sight of others (Mohammadi Mazraeh, 2022). Open and semi-open spaces can be said to play a significant role in enhancing residents' quality of life by providing environmental, social, and psychological benefits. Attention to the design and maintenance of these spaces in residential architecture is essential. Studies have shown that the presence of open and semi-open spaces in residential environments leads to increased resident satisfaction, improved physical and mental health, and strengthened social interactions (Abdollahi Mollai & Javan Forozandeh, 2021).

Research Methodology

This study was conducted to examine and compare

the patterns used in the semi-open spaces of historical houses in Ardakan during the Safavid and Qajar periods. To achieve this objective, a descriptive-analytical approach and comparative analysis were employed. Data were collected through the examination of historical documents and records, field observations, oral sources, and library research.

In terms of temporal scope, the study focuses on the Safavid and Qajar periods and includes case samples from each era. Initially, over 20 historical houses from the Safavid and Qajar periods were selected. Following field visits and assessments, and based on the input of cultural heritage experts, 6 houses from the Safavid period and 6 from the Qajar period were chosen. The main criteria for this selection included preservation of authenticity, minimal spatial alterations, expert approval from cultural heritage authorities, and accessibility. The findings of this study contribute to a deeper understanding of the architecture of Ardakan's historical houses and the evolution of open and semi-open spaces during the Safavid and Qajar periods.

Research Background

The importance of recognizing open and semi-open spaces in historical houses is such that numerous studies have been conducted in recent years in the fields of spatial mass and ratio in historical houses, typology of open spaces, typology of semi-open spaces, and the identification of spaces such as iwan, talar, shanasheer, tarameh, and others. While historical house architecture in each region shares commonalities due to specific climatic and geographical conditions, it also possesses unique characteristics. Therefore, despite the vast body of studies in this area, which can guide future research, it is essential to study the historical houses of each region individually. Given that no independent study has been conducted on the typology of open and semi-open spaces in the historical houses of Ardakan, this research should be prioritized.

Pasian Khamari et al. (2017) examined the changes

in the architecture of enclosed spaces in the historical houses of Gorgan, and through analysis of field data and historical records, they demonstrated that these spaces have transformed over time. Bonyani et al. (2018) explored the spatial relationship between open and closed spaces and analyzed the necessary characteristics for semi-open spaces, showing that semi-open spaces provide a balance between living in open spaces and transitioning into enclosed spaces, thereby moderating the sense of contrast between the exterior and interior. Rahravi Poodeh et al. (2018) focused on the morphological typology of the main spaces in multi-courtyard houses in Isfahan, revealing that the orientation of the courtyard and climatic factors influenced the spatial arrangement and determined the spatial organization of the houses. Maddahi et al. (2018) investigated the impact of semi-open spaces such as iwan and sofeh on the lifestyle and behavior of residents, emphasizing the importance of preserving these spaces in contemporary housing design through a comparative analysis between traditional and modern houses. Rahravi Poodeh et al. (2019) studied the characteristics of four-courtyard houses and their impact on the internal aesthetic qualities of Isfahan's introverted houses, extracting recurring features and analyzing their role in the spatial structure of historical houses.

Theoretical Foundations

• The concept of semi-open space

The architecture of vernacular houses in many cities along the desert margins of Iran has been shaped by climatic, functional, and cultural considerations through a combination of open, semi-open, and enclosed spaces. The history of semi-open spaces in Iran dates back more than two thousand years to the Achaemenid period. The presence of iwans in the palaces of Pasargadae and the Apadana Palace in Persepolis during the Achaemenid era, the Hatra Palace in the Parthian period, and the Sarvestan Palace and Qal'eh Dokhtar Palace in the Sasanian period all confirm this notion. After the advent of

Islam, these spaces continued to appear in Iranian architecture, including mosques, madrasas, houses, and more (Mahmoudi, 2005, 54).

• Typology of semi-open spaces (types of semi-open spaces)

Open and semi-open spaces are considered one of the essential components of traditional Iranian housing. In the majority of Iranian buildings and cities before and after Islam, three types of spatial configurations—open spaces, semi-open (covered) spaces, and enclosed spaces—were utilized. These spaces functioned complementarily and were not used independently in traditional Iranian architecture; rather, each gained meaning through its relation to the others. Based on general classifications, semi-open spaces include various types, some of which are unique to the vernacular architecture of specific regions. However, in general, the talar and iwan are the most common semi-open spaces shared across most vernacular architectures in Iranian cities and are among the most important and frequently used of such spaces (Mehrabian Mohammadi et al., 2021, 50). Researchers have proposed broader classifications in this regard, which are presented in Table 1.

• Effective components in the formation of semi-open spaces

Since the aim of this research is the typology of semi-open spaces in the historical houses of Ardakan, these spaces can be examined from various aspects, including spatial, physical, functional, climatic, and aesthetic dimensions (Table 2). Some of these components have played a more significant role in shaping semi-open spaces. Among the many influential factors, the key components include the location of placement, orientation or direction of extension (type of sun exposure), geometry and proportions, and function (Fig. 1).

The location of placement is one of the most important factors in defining and determining other characteristics of semi-open spaces. Depending on which side of the courtyard these spaces are located,

Table 1. Introduction, definition, and function of different types of semi-open spaces. Source: Authors based on Raheb & Nazari, 2018, 41.

Type	Definition and Function
Ravagh (Colonnade)	A porch-like iwan constructed at a secondary level; defined as a covered, columned corridor in front of a building, serving as a transitional space before entering the interior.
Soffeh	Originally a mounting platform for horse riders; a roofed veranda or alcove within a large room, with a slightly elevated floor. A platform or iwan raised above ground level, open on one side.
Mahtabi	An uncovered space found in many houses in hot climates, used for sitting or sleeping during warm nights. Its purpose is to allow visual connection with the sky.
Iwan	A roofed space opens on one to three sides, functioning as an intermediary between open and enclosed areas. Includes various types such as mahtabi and balcony.
Talar	A space larger than an iwan, often with a high ceiling and multiple openings to the courtyard.
Taqnama (Blind Arch)	Shallow arches constructed on exterior walls of rooms or beside courtyards, forming small semi-open areas.
Terrace	An open space whose floor is the roof of parts of the lower level; equivalent to the French terrasse, encompassing rooftop spaces and large open iwans.
Balcony	A console outside rooms on the second floor, usually roofless and narrow. Distinguished from a terrace by its smaller size.

their function and, consequently, their proportions and depth will differ. Orientation or the direction of extension in historical houses has been of great significance. These extensions are sometimes parallel to the courtyard facades and sometimes perpendicular to them. The direction of extension determines the depth of the semi-open spaces. The proportions of semi-open spaces vary depending on the functions and activities that take place within them, and the geometry of the spaces can introduce different characteristics into the environment. The distinct physical and functional features of semi-open spaces create various roles for these areas. These functions may range from stillness and presence to movement and dynamism. In this study,

semi-open spaces in Safavid and Qajar houses are examined and analyzed from the perspective of these components.

Introduction to the Study Area

Ardakān County, one of the historical and cultural cities of Iran, is located in the central part of the country. This county, which is part of Yazd Province, is bordered to the north and northwest by the deserts of Jandagh and Na'in, and to the south and west by the city of Meybod and the Gāvkhūnī Wetland. The climate of Ardakān is hot and dry due to its location in a desert region. The summer is extremely hot and dry, while the winter is cold and low in precipitation, which are the characteristic features of the climate in this area. During the Safavid and Qajar periods, Ardakān was of particular importance due to its geographical location and its strategic communication routes. This city was considered one of the major commercial and military hubs in central Iran. Many caravanserais and historical buildings in Ardakān belong to this period, indicating the importance of this city during that time (Esfanjari Kenari, 2006).

Introduction and Identification of Case Studies (Safavid and Qajar Period Houses of Ardakān)

Studies conducted on historical houses in Ardakān show that valuable houses from the Safavid and Qajar periods can be found in this city. Based on research conducted by the Cultural Heritage Department, consultations with experts in this field, and field visits to the existing houses, 22 houses were initially selected. Due to the damage and deterioration of some buildings, 12 houses, including 6 from the Safavid period and 6 from the Qajar period, were ultimately selected. The reasons for the selection of these 12 houses from the 22 houses in the study population can be summarized as follows: Efforts were made to select examples that, while being within accessible locations, 1. Have preserved their authenticity, 2. Have undergone minimal changes over time, and 3. It

Table 2. Dimensions and Influencing Components in the Formation of Semi-Open Spaces. Source: Authors based on Omidvari et al., 2021, 23.

Components	Dimensions
Settlement location (summer or winter front)	Spatial Dimension
Proximity of spaces (with relation to adjacent closed and semi-open spaces)	Spatial Dimension
Access levels	Spatial Dimension
Type of relationship with adjacent spaces (formation of functions)	Spatial Dimension
Degree and type of relationship with the courtyard	Spatial Dimension
Geometry and shape of the space	Physical Dimension
Amount of openings	Physical Dimension
Floor level height	Physical Dimension
Depth of space	Physical Dimension
Proportions	Physical Dimension
Enclosure of the space	Physical Dimension
Spatial view, presence of scenery, and natural views	Physical Dimension
Biological or communicative function	Functional-Behavioral Dimension
Type of function of adjacent spaces	Functional-Behavioral Dimension
Behavior type in space over different times of the day	Functional-Behavioral Dimension
Type and nature of interactions in space	Functional-Behavioral Dimension
Orientation or direction of elongation	Comfort-Climate Dimension
Orientation relative to sunlight	Comfort-Climate Dimension
Type of received radiation	Comfort-Climate Dimension
Heat and radiation protection	Comfort-Climate Dimension
Use of air flow	Comfort-Climate Dimension
Creation of variety in building materials and colors in interior façade	Aesthetic Dimension
Artistic details of decorations	Aesthetic Dimension

has been approved by experts at the Cultural Heritage Department. In [Table 3](#), the 12 selected houses are introduced, along with information regarding their registration number, location, and current condition maps. These examples were chosen for being recommended by the Cultural Heritage Department, being accessible, and being available for field research.

Open and Semi-Open Spaces in the Studied Houses

In the desert regions of Iran, due to similar climatic and geographical features, comparable patterns of mass and space organization can be observed in historical buildings. Ardakan, as one of the desert cities—like Yazd, Kashan, and Isfahan—features models of central courtyard houses with spatial organization comprising open, semi-open, and enclosed spaces. In the houses of this region, depending on the residential patterns, local culture, and microclimates, different types of open and enclosed spaces can be found.

The typology of courtyards in the historical houses of Ardakan during the Safavid and Qajar periods indicates that, like most traditional houses in desert regions, the central courtyards have rectangular proportions and geometry. These are located at the heart of the house, surrounded by enclosed masses, and are organized along a north-south axis. Among the selected houses, nearly 50% are single-courtyard houses, while the rest feature two courtyards. In the initial analysis of the spatial system (mass and space) in Safavid and Qajar houses of Ardakan, the land area and built-up area on different floors were extracted ([Table 4](#)). Although the selected houses vary widely in terms of land area, what matters in this study is the ratio of open and semi-open spaces to the total land area or total built-up area ([Table 5](#)).

The Findings show that in Safavid houses, the percentage of courtyard area varies between 22% and 37%, with an average of 29% of the total land area. In two-courtyard houses, this figure represents the sum of both courtyard areas. In contrast, in Qajar houses, the courtyard percentage ranges from 18.5% to 32.5%, with the average courtyard area accounting for 25% of the total land area. Studies indicate that although these houses experienced a reduction in courtyard size over time, the presence of semi-open spaces has compensated for the residents' needs by increasing their share of the total house area. Analysis of these proportions reveals that in houses from both

Table 3. General Characteristics of Case Study Samples. Source: Authors.


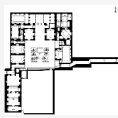















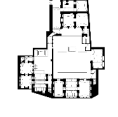






Period	Name of house	Registration No	Location	The photo of the house	Ground plan
Safavid Houses	Mohammad Jahanbani House	15095	Ayatollah Khamenei Street, Ali Bek Neighborhood		
	Haji Ali Akbari House	-	Ayatollah Khamenei Street, Shahid Ghanei Street		
	Old Mazloom House	13791	Ayatollah Khomeini Street, Haeri Street - Tiran Neighborhood, Ali Naqi Water Reservoir Alley		
	Haji Abbas Abumohammadi House	15129	Ardakan - Ayatollah Khamenei Street, Ayatollah Fakoor Street		
	Bamanali Shafiee House	-	Haeri Street, Fakoor Street		
	Farid House	23885	Ayatollah Khamenei Street, Charkhab Neighborhood, Shahid Haji Ahmadi Alley, Opposite Haji Ahmad Water Reservoir		
Qajar Houses	Hakim Bashi House	22773	Shahid Ghanei Street, Baladeh Neighborhood, Jameh Mosque Alley, Hakim Bashi Door		
	Haji Nasir House	30836	Ayatollah Khamenei Boulevard, Ali Bek Neighborhood, Shahid Mazkouri Alley		
	Ahmad Shaker House	13794	Ayatollah Khamenei Street, Inside the Square, No. 21		
	Soltanat House	-	Shahid Ghanei Street, Charkhab Neighborhood		
	Old Shamsi House	13797	Charkhab Neighborhood, Old Shamsi House		
	Ali Kafi House	18747	Imam Khomeini Street, Sina Street, Kafi Alley, No. 64		

Table 4. Typology of Spatial System (Mass and Space) in the Case Studies (Color Guide: Blue: Open Spaces, Green: Semi-open Spaces, Red: Enclosed Spaces). Source: Authors.

Period	House Name	Land Area	Ground Floor Area	Mass and Space			Schematic Plan
				Open	Enclose	Semi-Open	
Safavid	Mohammad Jahanbani House	839	539.659	46.3075	299.341	4935.51	
	Haj Ali Akbari House	736	463.6138	52.2929	272.5862	4110.92	
	Mazloom Historical House	674	463.498	99.0421	210.502	3645.59	
	Haj Abbas AbouMohammadi House	604	454.264	55.3279	149.736	3981.36	
	BamanAli Shafiei House	501	381.15	30.7055	119.085	3504.45	
	Farid House	453	354.1105	78.7949	98.8895	2756.31	
Ghajar	Hakim Bashi House	901	732.2898	164.1701	168.7102	5681.197	
	Haji Nasir House	743	562.9122	82.2237	180.0878	4805.885	
	Ahmad Shaker House	528	357.6493	88.9739	170.3507	2684.754	
	Shamsi Historical House	513	368.46	93.6141	144.54	2748.459	
	Saltanat House	301	211.5867	28.6644	89.4133	1822.923	
	Ali Kahfi House	186.3	144.6882	18.5514	41.6118	126.1368	

Table 5. Average Yard-to-Plot Area Percentage in the Historical Houses of Ardakan during the Safavid and Qajar Periods. Source: Authors.

Historical Period	House Name	Ground Floor Area	First Floor Area	Basement Area	Total Built Area	Yard to Area %	Average Yard %
Safavid Houses	Mohammad Jahanbani House	540	143	45	728	36%	29%
	Haj Ali Akbari House	463	—	—	463	37%	
	Old Mazloumi House	463	92	58	613	30%	
	Haj Abbas AbouMohammadi House	468	78	72	618	25%	
	Bamali Shafiee House	381	65	—	446	24%	
	Farid House	354	—	27	381	22%	
Qajar Houses	Hakim Bashi House	732	149	145	1026	18.5%	24.5%
	Haji Nasir House	563	271	175	1009	24%	
	Ahmad Shaker	357	122	34	343	32.5%	
	Saltanat House	211	-	56	267	29.5%	
	Shamsi House	368	60	28	456	18.5%	
	Ali Kahfi House	145	-	-	145	23%	

periods, a balanced coexistence of open, semi-open, and enclosed spaces can be observed. These changes suggest that over time, the importance of semi-open spaces in the houses of Ardakan has increased.

Typology of Semi-Open Spaces in Safavid and Qajar Houses of Ardakan

The study of semi-open spaces in Safavid and Qajar houses shows that these spaces exhibit various types in terms of location, geometry, and function. These can be classified into three spatial categories.

• Type I: Residential semi-open space (Tālār)

This type of semi-open space, in terms of its dimensions and proportions, is designed to accommodate family gatherings and support daily domestic activities. These spaces vary in depth and shape, resulting in several subtypes. The primary form of residential semi-open space in the historical houses of Ardakan is commonly known as the “tālār”, which is significantly larger than the main indoor rooms and constitutes one of the key architectural elements of these traditional homes.

Typically located on the southern side of the house, the tālār serves as a summer living area and receives indirect light from the north. It is generally used for family gatherings, breakfast, and afternoon tea during the spring and summer seasons. Positioned adjacent to enclosed rooms,

the tālār functions in conjunction with them, allowing for partial extension of its activities into neighboring spaces. This spatial continuity between the tālār and the surrounding closed rooms provides a high quality of living and environmental comfort. The geometry and proportions of the tālār exhibit significant diversity. From the perspective of floor plan geometry, three main subtypes can be identified:

In this subtype, the semi-open space takes the shape of a cross and connects to adjacent rooms from multiple directions. These cruciform tālārs are unique and exhibit a highly integrated spatial configuration. In this variant, the tālār is rectangular and aligned along the same axis as the courtyard. These deeper spaces typically provide better shading, particularly during the summer. They also vary in quality depending on their roof structure and ceiling treatment. This subtype features a rectangular shape that is oriented perpendicular to the courtyard’s main axis. These spaces are usually shallower than the previous type but offer more effective shading due to their orientation. It is important to note that this categorization is based on horizontal geometry and spatial function. Further diversity may exist based on vertical proportions, ceiling forms, and roof structures, which will be addressed in future research.

• **Type II: Residential-passage semi-open space (Shallow Iwān)**

This type of semi-open space has a shallower depth and greater length compared to the tālār type. It is typically aligned with the facade that faces the courtyard. These shallow “iwāns” are often used for short-term seating or as movement-oriented spaces, offering access or circulation within the house. As a semi-open residential-movement space, these iwāns serve as connectors between the open courtyard and the adjacent rooms. Their shallowness generally enhances the relationship between the outdoor and indoor spaces, making them a significant element in the overall organization of the house.

• **Type III: Passage semi-open space**

These semi-open spaces function as transitional

zones that connect the open courtyard with the enclosed rooms of the house. These spaces are typically elongated and designed to facilitate movement between areas. Depending on the direction of movement — whether in alignment with the user’s path or perpendicular to it — their quality and proportions vary, offering different spatial experiences. The diversity in the alignment of these spaces contributes to a range of movement-oriented spatial configurations for the inhabitants. The analysis of these three types of semi-open spaces — residential (tālār), Passage, and residential-passage (shallow iwān) — based on factors such as location, orientation, geometry, proportions, and function can be summarized as follows (Table 6). In Tables 7 & 8, one house from

Table 6. Analysis of Semi-Open Space Types in Historical Houses of Ardakan Based on Morphological, Functional, and Locational Components. Source: Authors.

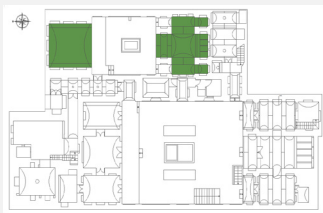

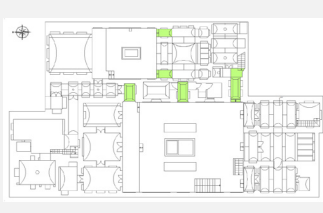
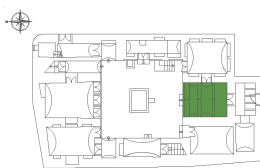
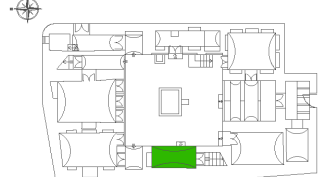
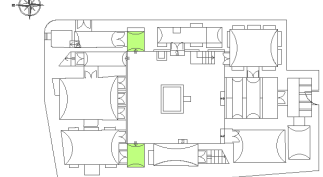
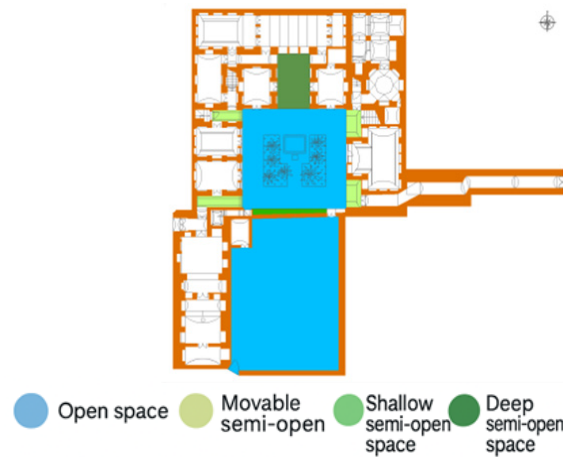
Component	Semi-open Residential (Hall)	Semi-open Residential-Passage (Shallow Veranda)	Semi-open Passage
Location	These semi-open spaces are generally located on the southern side of the courtyard, receiving indirect northern light.	These spaces are typically situated opposite three- and five-door rooms on various fronts of the house, or on the eastern side of the courtyard where the reception of western light limits the establishment of large, functional spaces.	Generally acts as a transitional space between open and enclosed areas. They are located in various parts and fronts of the house.
Direction or Axis of Elongation	The elongation and direction of these spaces are either along the direction of the courtyard or perpendicular to the direction and elongation of the courtyard.	These spaces are typically shallow, and their elongation follows the direction of the courtyard fronts.	The elongation of these spaces occurs along different axes.
Geometry and Proportions	The geometry of these spaces is typically square or close to rectangular, sometimes even cruciform.	The geometry of these spaces is typically rectangular.	These spaces are typically known as small-scale spaces, with rectangular geometry and small dimensions.
Function	These spaces are generally places for family gatherings and interaction, especially during the warmer seasons.	They are used for short-term stays and sometimes have a functional, transitional role.	These spaces are generally recognized as movement spaces.
Safavid-Mazloom house			
Ghajar-Kahfi house			

Table 7. Analysis of the Mohammad Jahanbani House as a Representative of Safavid-Era Houses Based on the Design Criteria of Semi-Open Spaces. Source: Authors.

Analytical Cases	Description
Type of Space	Semi-open Space (Iwan and Talar)
Semi-Open Space Type	Deep residential semi-open (Talar)Elongated and shallow residential semi-open (Shallow Iwan) Passage semi-open (intermediate space)
Location	Residential semi-open: northern and southern façadesPassage semi-open: eastern and western façades
Geometry and Orientation	Residential semi-open (Talar): rectangular geometry aligned with the courtyard axisResidential semi-open (shallow iwan): rectangular geometry perpendicular to courtyard axisPassage semi-open: rectangular geometry in varying orientations
Function	Residential semi-open (Talar): space for daily activities during cold seasons, receives southern light residential semi-open (shallow iwan): temporary sitting areaPassage semi-open: acts as a transition between open and enclosed spaces

Plan



Figs.



the Safavid period and one from the Qajar period are analyzed as case studies based on the design criteria of semi-open spaces.

• Results from data analysis (quantitative analysis of semi-open spaces in Safavid and Qajar houses)

Based on the conducted studies and the identification of various types of semi-open spaces in the Safavid and Qajar houses of Ardakan, three spatial types were identified. Among all the houses, the residential semi-open space (Talar) and the passage

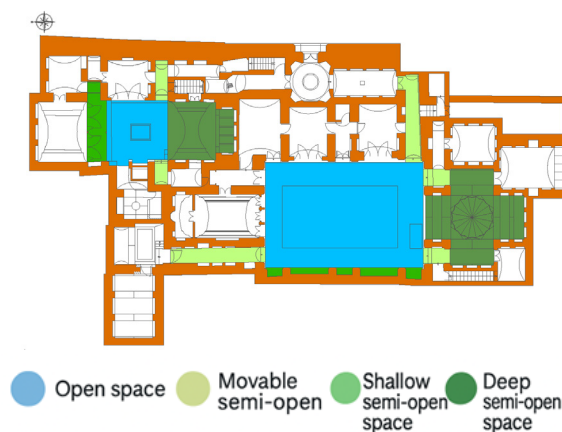
semi-open space are present in every case, whereas the residential semi-open space (shallow iwan) is observed only in some of the houses (Table 9).

The second most frequent type of semi-open space is the passage type. These spaces act as transitional or intermediary zones and play an essential role in the spatial hierarchy of access and in linking enclosed and open areas. They are typically meaningful, as they serve as connectors between the courtyard and interior spaces. In Ardakan houses, a variety of such passage-type semi-open spaces can be observed.

Table 8. Analysis of the Hakim Bashi House as a Representative of Qajar-Era Houses Based on the Design Criteria of Semi-Open Spaces. Source: Authors.

Analytical Cases	Description
Type of Space	Semi-open Space (Iwan and Talar)
Semi-Open Space Type	- Deep residential semi-open (Talar) - Elongated and shallow residential semi-open (Shallow Iwan) - Passage semi-open (intermediate space)
Location	- Residential semi-open: on the southern façades of both main and secondary courtyards - Passage semi-open: in multiple façades of both courtyards
Geometry and Orientation	- Residential semi-open (Talar): large cruciform-shaped talar in the main courtyard and rectangular talar in the smaller courtyard - Residential semi-open (shallow iwan): shallow rectangular geometry - Passage semi-open: repeated rectangular forms across various parts of the courtyards
Function	- Residential semi-open (Talar): used for daily activities during warm seasons, placed on the summer-facing side of the house - Residential semi-open (shallow iwan): minimal depth, used for short-term sitting - Passage semi-open: acts as a connector and access space from courtyard to enclosed rooms

Plan



Figs.



Depending on the degree of their connection to the courtyard and their elongation relative to it, their spatial character may vary.

The least frequent type is the residential shallow-depth semi-open space. These do not fully function as primary residential areas like the Talar, nor do they operate as connecting zones like passage spaces. Often with limited depth, they occasionally serve as short-term seating areas. This type of semi-open space has seen an increase from the Safavid to

the Qajar period and tends to serve more qualitative and symbolic purposes than functional roles in Ardakan houses.

Conclusion

The study and analysis of Ardakan houses from the Safavid and Qajar periods reveal the presence of three distinct types of semi-open spaces in these historical houses. The first type includes deep residential semi-open spaces, commonly referred to as Talars

in historical Ardakan houses. The Talar is one of the most important semi-open spaces in both consecutive periods and constitutes a defining element of the spatial identity of Ardakan's historical architecture. These spaces take on various geometries, such as cross-shaped or indented forms, and elongated rectangles perpendicular or parallel to the courtyard axis. This category also contains subtypes in volume and form and accounts for the largest share of semi-open spaces. The second type comprises passage semi-open spaces, which follow the Talar in terms of spatial frequency. These spaces generally function as intermediaries, acting as important connectors between enclosed and open areas.

The third type accounts for a much smaller portion of the semi-open spaces. This type includes a mixture of residential and passage-like characteristics and does not form a primary component of semi-open spaces in Ardakan's historical houses. It exists only in certain houses as needed.

Among the three types, residential semi-open spaces (Talars) occupy the largest surface area, averaging around 7% of the total semi-open spaces in both the Safavid and Qajar periods. The smallest share belongs to residential-passage semi-open spaces or shallow-depth iwans, averaging only 1% of the house's surface area in both periods.

Several factors have contributed to these transformations. Geographic conditions, the emergence of new qanats, changes in the political structure, and the resulting shifts in family living patterns have all played significant roles. Due to the extent of these factors, a separate article will address them in detail in the future.

Declaration of No Conflict of Interest

The authors declare that they have no conflict of interest in conducting this research.

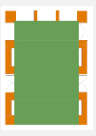
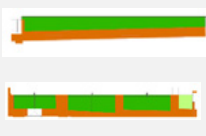
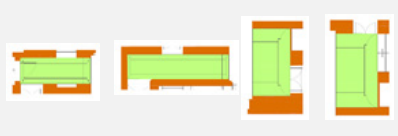
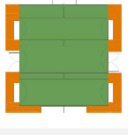

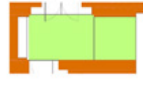


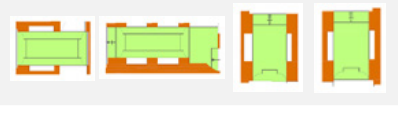
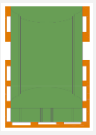

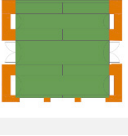

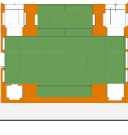



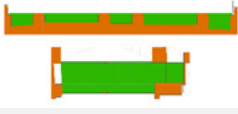

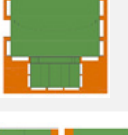







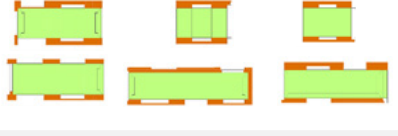

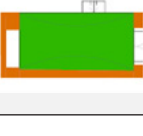
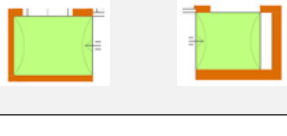
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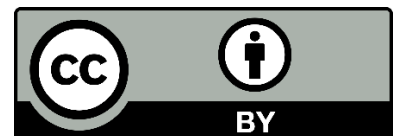
Table 9. Typology of Semi-Open Spaces in the Historic Houses of Ardakan .Source: Authors.

Type of Semi-Open Space ◀	Residential (Talar)	Residential (Shallow Iwan)	Passage
Safavid Houses			
Mohammad Jahanbani House			
Haj Ali Akbari House			
Mazloom Old House	✓		✓
Haj Abbas AbouMohammadi House			
Bamanali Shafiei House			
Farid House			
Qajar Houses			
Hakim Bashi House			
Haji Nasir House			
Ahmad Shaker House			
Soltanat House			
Shamsi Old House			
Ali Kahfi House	✓ 		

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