

Combination of Patterns in the Architecture of Historical House; Case Study: Sadeqi's House in Lahijan City

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ABSTRACT

Before Qajar era, the vernacular architecture was widely used in Gilan with totally climatic approach. Current methods were completely changed by the arrival of Qajar architecture, which was a combination of imported architecture and previous architectural style. It is important to say that the Iranian architect tries to find local elements in the process of building and so it helped him to persist Gilan's vernacular climatic architecture approach. In the other words, how and to what extent did vernacular climatic approaches and imported elements affect the process of building and building itself? The main question of this research is as the following: Was the combination of the patterns in conformity with residents' needs? This issue is very important especially in the process of documentation of historical buildings, which indicates the necessity of keeping ancient and valuable architectural works as well as its conformity with the current architecture of the region to achieve sustainable patterns in construction. One of the most important findings of the current research is the combination of the two climatic and stylistic approaches in the architecture of Sadeqi's House. Studying the architectural elements in this building show that instead of being completely influenced by a type of architecture including numerous signs of richness and pride, combination of Gilan's climatic architecture and the imported architecture was used in this building.

Keywords: Gilan's Architecture, Safavid Architecture, Qajar Architecture, Sadeqi's Historical House.

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1. INTRODUCTION

Generally, it is possible to divide Qajar architecture into two parts as the following: 1. From Agha Mohammad Khan Qajar up to end of Mohammad Shah Qajar Monarchy, when Isfahani style (related to Safavid, Afsharid and Zand dynasties) dominated and 2. From Naser al-Din Shah Qajar monarchy to the first Pahlavi era when sending the Iranian students to Europe resulted in a combined style formed by western and vernacular architectures (Haghpour, Mazloun Borhan, & Pirbabai, 2015, p. 45). During the Qajar era, because of being on the Europe Trade way and also production of different important goods such as silk, tea and rice, Gilan had significantly changed and evolved, as a result the vernacular architecture had greatly influenced. The vernacular architecture played an important role in the process of building before the advent of Qajar architecture to Gilan, because the architect tried to make a building with the minimum cost and maximum efficiency, considering the climatic conditions. In the present study, the researcher wants to answer this question: what are the most important elements the Gilanian architect tried to use in the process of building Sadeqi's House to maintain the climatic approach used in Gilanian architecture after the advent of Qajar architecture? In other words, to what extent did vernacular climatic elements and imported elements affect the architecture of this house? The present study is descriptive research in which data were collected using field study and desk study and analyzed by content analysis. In the present study, first the architectural characteristics of houses located in Gilan were studied and then, the characteristics of Safavid and Qajar architectures and arts were investigated. Moreover, the history and urban architecture of Lahijan were studied based on the historical documents and selection of Sadeqi's House as an unchanged sample, whose architecture was relatively remained.

2. ARCHITECTURAL FEATURES OF GILAN'S URBAN HOUSES

The vernacular architecture of Gilan comes from the climate (mild and humid weather) of the region. There are two factors which affect the form of architecture and the building body: 1. Saturated moisture and 2. High groundwater levels. Gilanian architects emphasize to build an Eivan (porch) (for air rotation and creation of shadow in hot seasons), base course (in order to minimize the ascending humidity) and even the sloping roof (in order to prevent the accumulation of rain on the roof). These factors vary in form based on the location of building (plain, foothill, mountain or Champaign (Khakpour, 2014, p. 82). by assuming that all the architectural elements in each region have direct relationships with its cultural characteristics, the details of urban houses in Gilan are discussed:

2.1. Entrance System

Within the aristocratic houses in Gilan, which were remained from the stylistic architecture of Safavid era, the entrance system includes the following hierarchy:

Passage → Entrance (Door) → Corridor or Courtyard → Porch

In some houses, there are also Pishtaq¹ with two platforms on both sides of the entrance with a door, a corridor and a vestibule which seems to be introduced to this region from the other regions of Iran. In this pattern, the hierarchy is as follows:

Passage → Pishtaq → Entrance (Door) → Vestibule → Corridor → Courtyard → Porch

The houses of upper class included a portal or an entrance door with a door knocker and the portal is composed a frame and plates on it. In the houses of middle class, the entrance was simple and after it there is a building and what can be seen from the passage is a simple door and sometimes there is a curtain after the door that opens to the courtyard.

2.2. Climate and Building Orientation

Using base course, sloping roof and porch shows the adaptation of human with the climate in Gilan. In the physical structure of building, the first floor is located on the base course in order to keep the interiors safe from moisture. The porch is designed in order to use the light and breeze and even to prevent the west part of the building from rainfall.

2.3. Building Site and Standing Property

In Gilan architecture, there are generally no volumes around the courtyard. In some cases, the building is in the middle of the courtyard and the empty spaces are around it. Fruit trees and wells which supplied water for residents are in the courtyard. In the ancient texture of neighborhoods in Gilan, most of the houses have one building² and there are a few houses with two buildings which are owned by the upper class. The first map of Rasht, designed by Zulfiqar Khan and on the order of Naser al-Din Shah Qajar in 1870, shows 5116 houses. In the most houses, the building site is a green space and the building is located in its center or on one of its sides (Khakpour, 2016, p. 7) (Fig. 1).

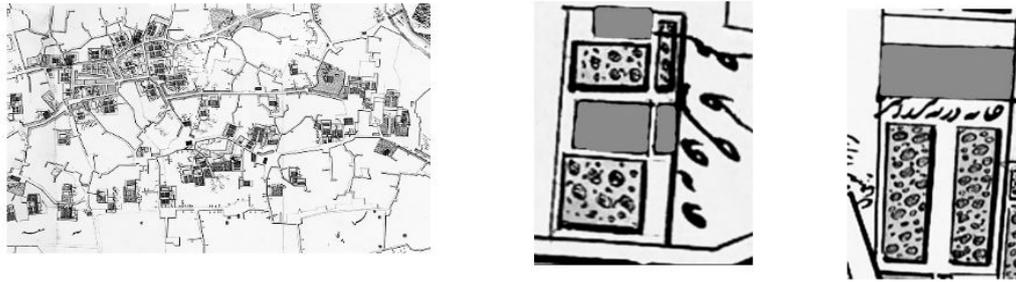


Fig. 1. Part of Rasht's Map (1870), Magnification of Two Residential Lots with One and Two Buildings (The Residential Part is Shown in Dark Color)
 (Farasati, 2002, p. 352)

2.4. The Body of Building

Studying the houses in Gilan shows a dominant pattern which includes a part in the middle part of the building and two parts on sides. Thus, in the middle part, there are a corridor, a Sedari (three windowed room) or Panjdari (five windowed room) or in some cases, a porch. The vertical relational element, i.e. stair, is situated in the first layer after Talar (throne hall) and it is repeated twice according to the symmetrical pattern.

3. THE STRUCTURAL HIERARCHY OF THE BUILDING

The vernacular architecture of Gilan is compatible with mild and humid climate. Hence, the architects always considers the climate in order to choose the kinds of spaces and their arrangement.

3.1. Eivan (Porch)

The porch has a lot of efficiency against air humidity. This semi-covered spaces creates the shadow to balance the temperature and allows rooms to become cool when the breeze blows to the outer part of walls. Porches are generally formed in four forms as follows: one porch, two porches, three porches and four porches. In hot seasons, the porches play an important role in controlling the thermal behavior of the house and ventilation (Khakpour, 2013, p.82) (Figure2). Sometimes, these porches are surrounded with wood and glass, which are called ambulatory. In the recent years, locating the porches in the middle of the spaces was one of the main patterns common in Gilan architecture. In this pattern, the porch doesn't have the climatic function of four porches spaces due to being enclosed. This kind of porch becomes blocked gradually and changes to a space for access to the neighboring space and provides an opportunity to use fossil energy to cool down the building.

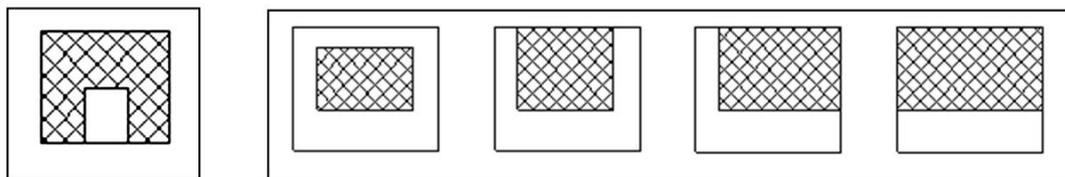


Fig. 2. Four Patterns of Porches, The Late Pattern and the Arrangement of Empty and Full Spaces Relative to Each Other
 (Khakpour, 2013, p. 82)

3.2. Rooms

Most urban houses in Gilan are on two floors and have a maximum of four rooms. These rooms are built next to each other in a row (connected to each other with internal doors) and on two separate floors. As the season changes, the use of rooms also changes. The area and the location of these rooms play an important role in the function of the room. Talar or alcove is a place behind the main porch and is the biggest room on each floor. Alcove is also including valuable decorations on niches³ as well as Sash windows and wood ceiling (Khakpour, 2016, p.5). Later houses don't have porches and pishtaq, toilet and the store are located in a place separated from the main building.

3.3. Crawl Space

In the plain region of Gilan, the houses don't have any basement because of the high groundwater levels, thus a place called crawl space is formed in order to allow the air flow in the space beneath the building and thereby cooling it in the hot seasons. This space is provided with some openings as windows on the outer wall of the building foundation and make it possible to exit the air. In cold seasons, the floor of the building is protected from the cold winds by closing these openings.

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Fig. 3. Avanesian's House in Rasht

3.4. Stairs

Stairs had an important role because of their special function and before Qajar dynasty, they had usually

hidden in the back of the main facade. In Qajar period, this element was added to the outer part of the building and is usually seen in symmetrical form on both sides (Fig. 4).



Fig. 4. Mirza Khalil Rafi's House in Rasht

3.5. Façade

In Gilan architecture, the outer personality of the building shows that this kind of architecture has two layers in face and concept: 1. Main facade which has a direct relationship with the viewer and has light and transparent wooden columns and fences and 2. The second face which is located behind the first facade includes walls, doors and windows. This sample is unique in Iranian architecture because the main façade always follows the elements of the second layer in structure and stability (Khakpour, 2014, p. 11).

3.6. Structures and Materials

The foundations are of limestone and sometimes brick and the walls are load bearing according to the high humidity of this region which leads to the high differences of temperature between day and night, sunshine and shade and even summer and winter, it is impossible to use the clay because of its high thermal capacity⁴. Some materials such as cobble and lime, which ensure the prevention of moisture, were used to make the foundation (Khakpour, 2014, p. 11).

3.7. Roof

In Gilan architecture, the roof is of sloping roof with wooden crates⁵ and covered by pottery⁶, tin or even the combination of these. These roofs are built with some stacks to lengthen the roof's beams to cover the porch (Khakpour, 2013, p.83).

Because of using tin and thereby radiation heat retention beneath the roof, there was a hole called Lojanak on the roof in order to allow draught and provide access to the roof.

3.8. Decorations

Because of the high humidity and the short life of materials, most of the buildings in Gilan are owned to Qajar period and onwards. Generally, the decorations are seen on the capitals, cymatiums, the column-beam junction, and sometime corners. The decorations of beams are more frequent. In the case of using clay and brick in the building structure, the same materials were used for decorations which were usually seen in pottery seal⁷. Other decorations such as tiling (Faience mosaic and seven-color tile), plaster (Karbandi and various types of arabesque), sculpture (Muqarnas) and even painting (painting of nature and human) (Khakpour, 2017, p. 62). Because of the high height of the interior, the upper cornices of doors and windows were covered with a grid of wooden Gereh. They cannot usually be opened and are locally called Khafang. It is important to use this kind of window because of the region's weather in order to provide more lighting. Moreover, using the colorful glasses makes the interior place more fun (Fig. 5).



Fig. 5. Decorations Under the Roof of Avansian's House in Rasht: Lathed Cymatium Motifs of the Beams Under the Roof and Motifs of Capitals

4. FACTORS AFFECTING ARCHITECTURE

There are some factors affecting the form and the quality of architecture:

4.1. Axis and the Hierarchy

The axis in the whole building, including courtyard and residential space, is longitude and along the building length. The access to building is related to the land orientation relative to the passage, in addition to the hierarchy in the entrance system. The geometry of building site, symmetrical gardens and sometimes fountains are located on the main axis of the area. The axis was very independent of the main building and façade and makes a significant relationship between

the passage and the building body, first with the semi-open space (Eivan) and third the closed one (rooms) (Khakpour, 2014, p. 3).

4.2. Wind Direction and Pleasant Light

In Gilan, the wind direction is north-south in the day and vice versa at night. According to the pleasant light of these two fronts, the openings used on these fronts are of great importance. On the other hands, the building elongation, from east to west, leads to the provision of the maximum light on the south front (in cold seasons) and cool breeze on the north front (in hot days) (Kasmaei, 1984, p.116) (Fig. 6). Generally, the colorful sashes⁸ belong to the alcove.

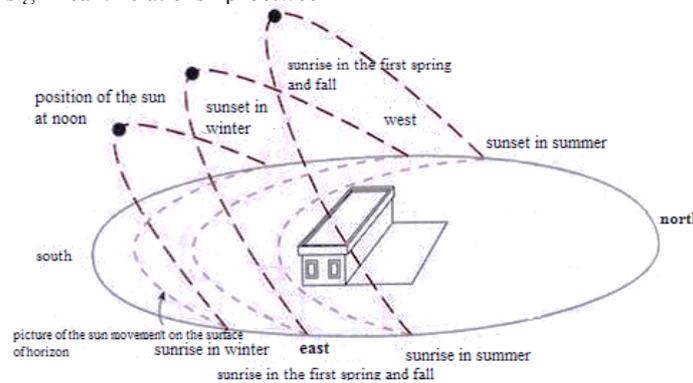


Fig. 6. Building Elongation in the East-West Direction in Summer and Winter
 (Kasmaei, 1984)

4.3. Privacy and enclosure

In the residential architecture, one of the important issue is the division of building site into three main parts as follows: private, public, semi-private and semi-public. One of the characteristic of Gilan architecture is the lack of nested layers in the buildings. In this type of architecture, separation of the indoor and outdoor is not observed. In this regard, rooms, which are regarded as private space, are located in front of the courtyard and there isn't any enclosure (Khakpour, 2016, p. 5).

4.4. Visual Weight

In Gilan architecture, inducing a sense of symmetry feeling as valuable as symmetry. In other words, there is an invisible line or point in the plan or facade and the elements were located on both sides of this invisible axis. If the elements don't repeat on both sides, they would choose in a way that the viewers don't feel the visual weight. By the arrival of the Qajar architecture, stairs were located out of the buildings, leading to the disturbance of visual symmetry.

5. FEATURES OF SAFAVID AND QAJAR ARCHITECTURE AND ART

By the advent of Shah Abbas monarchy, the authority of the central government increased, the safety of the roads increased and the rich businessmen demanded for houses with high-quality materials. The portal of the houses was the symbol of owner's richness. The pool is one of the most important elements of Safavid architecture which was commonly used for ablution in Muslims' houses. Existence of plant and water makes the place more pleasant. The pool is located in front of the alcove to rarefy the air before entering into the alcove. The alcove has a cross plan and is covered with vault. In this period, the decorations were generally brick marquetry, Sashes, Gereh, Plastering and Graffiti. These graffiti were used in the period of Shah Abbas in order to compete with the European palaces. In Muslims' houses, the plant motifs were used while in non-Muslims' houses, including Armenian houses, human motifs were used (Chehrizi, 2015, p. 5). The motif of flowers and bushes was developed in the Safavid period and paintings on pen-cases, the mirror frames, pictures and oiled covers had gradually become popular. In this period, trees (place of birds) were painted out of the symmetrical axis and composition of motifs was active and animated. Another feature of Safavid motifs is the use of various birds.

6. HISTORICAL GEOGRAPHY OF LAHIJAN CITY

In the cultural geography of Gilan, it was divided into two regions: east (Biehpish) and west (Biehpas). According to Robino, the capital of Biehpish was Lahijan and the capital of Biahpas was Fooman. He states about Lahijan as follows: this city was built by Lahij ibn Sam ibn Noah. Lahijan was called Dar al-emareh or Dar al-aman (Rabino, 2003, p.339), and

then its name was changed to Lahjan al-mobarak. Based on the documents, this city was superior to other regions in Gilan because other regions are places for upper classes and Lahijan was the first region with the culture of urbanization. Hamdollah Mostofi introduced Lahijan as "a big city and Dar al-molk Jeilanat". This city was government center of Kiaee in Biahpish region in Gilan. By the beginning of the government of Kiaeean Zeidi which were the enemies of Isma'ilism and Daylamites, these two dynasties finished in Gilan. After that the name of the city changed from Deilamestan to Gilan. Up to the Safavid dynasty, this city was the center of Kiaee government in Gilan. Kiaee dynasty was the most famous government in Gilan from the Eighth to eleventh century lunar. The main core of Lahijan included 7 neighborhoods as follows: Gabane, Shaarbaf, Pordeh sar, Meidan, Khomair Kalayeh, Ordoobazar and Karvansara bar.

7. ARCHITECTURE OF SADEGHI'S HOUSE

The ownership of this building is belonged to Mohammad Sadeqi which was sold to the Cultural Heritage, Handicrafts and Tourism Organization of Gilan in 2004.

7.1. Location

This historical house, known as Sadeqi house, is located in Ordoobazar neighborhood in Lahijan (Fig. 9). The main entrance of this building is located on the north-east direction which is able to provide access to the old Cinema Iran alley. The entrance on the south-west front is located in Zahed alley which is able to provide access to the inner spaces and today is considered the main door. The building is located on the south of the passage and the courtyard on the east side has a garden full of trees and a rectangular pool. The arcs in the walls are of Dor e-kamel and Pang O-haft arcs (Figs. 7, 8).



Fig. 7. Central Texture of Lahijan and Location of the Studied Building



Fig. 8. Location Plan, Wall Arch, Courtyard and Pool

Except for alcove, which is located behind the main Eivan and in the west of it and was built on one floor, the other spaces (10 rooms) were built on two floors, on the base course, with the height of 1.4 meters, after the building has the height of 4 meter from the base course to the ceiling. There is a porch in the east side of

the house with two wooden columns with a hexagonal cross section and carved capital, which distinguish it as the main façade from other façades. The roof of the building is of hip roof with two ridges, two stacks⁹ with a wooden crates and traditional pottery (Fig. 9).

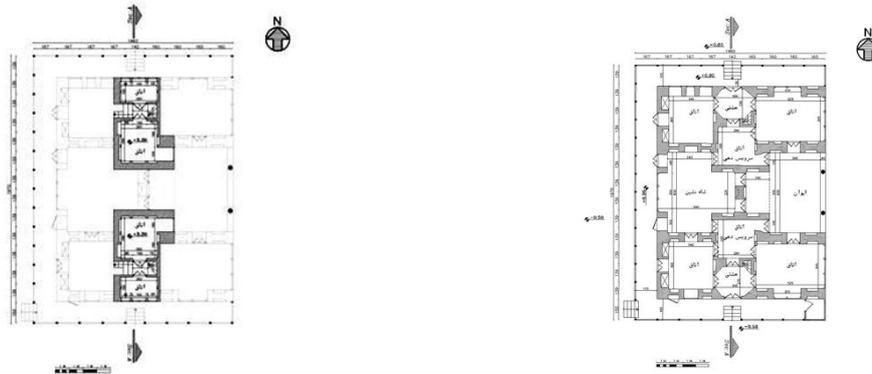


Fig. 9. Plans of Floors

There are two staircases in two vestibules with Kashkool-like pattern¹⁰ which help people to enter the rooms on the first floor. The arc in the rooms includes three parts including sharp, mild and inner arcs of the porch. The cross-like alcove includes beautiful sash windows on the west side because of the rain. The building has ambulatory on three west, south and north sides. The building structure is of support

wall (sometimes up to 80cm height). The decorations include some decorations on woods such as Muqarnas, Wooden Gereh with colorful glasses, painting of birds and flowers on the doors and plaster decorations such as plaster Muqarnas, strip decorations, outstanding motifs of flower and bird drawing of Hunting Park. The alcove has eight doors that two of them included the motif of flower and bird.



Fig. 10. Western and Eastern Facades of the Building

8. CRITIQUE OF ARCHITECTURE

The complex (including building site and standing property) has east-west elongation and the elongation axis of the plan is from north to south, which is not a good choice, because it exposes the west side to the rain. It seems that the reason behind this selection is the championship of the courtyard with a building with the appropriate depth (width/length ratio: 1:3). Lahijan has less humidity than other humid cities in Gilan and that is why most of the buildings in it don't have crawl space. On the first floor (ground floor), it is possible to access to the eastern rooms through the porch with many decorations. The spaces on this floor are according to Gilan architecture in order to host the

guests and to be used as living room by the residents. Access to the western rooms, including alcove and even two northern and southern rooms is provided just through the ambulatory. The rooms on the second floor have aedicule and niches in order to keep the staffs and also to be used as a place for resting. There are free of decorations. Stairs don't play an important role in this building. About façade, this building had been less influence by the Qajar architecture. The following elements show that the service nature of spaces on the second floor are more important in this building: less quality, symmetrical stairs and valuable decorations (Fig. 11).

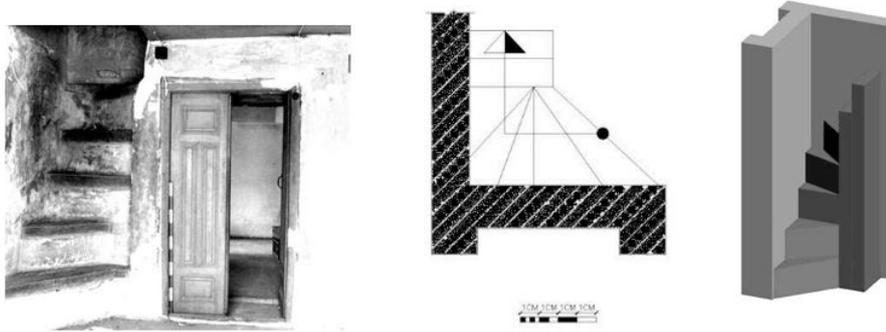


Fig. 11. Staircase

According to the location and plan of the porch, roof protrusion in the porch causes air confinement beneath it, and thereby increased air pressure, leading the breeze inside the house.

Therefore, the existence of high-depth canopy in the eastern porch leads to have a pleasant air in alcove in the hot seasons (Fig. 12).

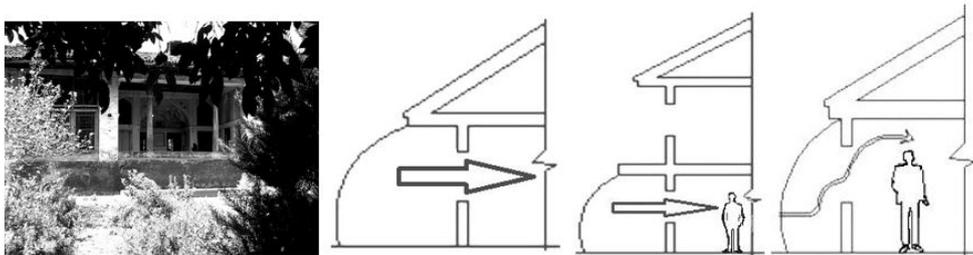


Fig. 12. Roof Protrusion Mechanism for Air Suction and Cooling of the Porch

Type of the window has a significant effect on the way of internal air and the amount of cooling. What makes openings, especially windows, important is their surfaces and location in the walls. Those windows located in front of each other and at the same level makes air suction

and thereby draught. The change in the location of such windows deviates the internal air flow, changing the quality and surface covered by air flow according to the location of exit openings (Fig. 13).

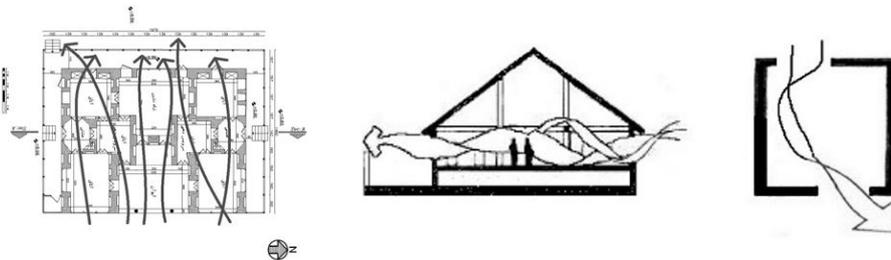


Fig. 13. Air Suction and Creation of Draught Using Windows in Front of Each Other and at the Same level

The thermal capacity of the material used for the exterior walls depends on the temperature, daily temperature fluctuation and the pattern and function of the spaces confined by these walls (Kasmaei, 1984, p. 257). The walls of the building pass the cycle of being hot and cold during a day and the interior and exterior surfaces don't experience the same temperature fluctuation. The temperature fluctuation in the interior surfaces is less than the exterior ones. If the thermal resistance of the wall is high, the time required to reach the minimum and maximum temperature by the interior surfaces relative to the outdoor temperature becomes greater. This delay is 1.3 hours for the wood and 12 hours for the brick (Kasmaei, 1984, p. 34). Therefore, the slow reaction of the building toward the wind and change of the outdoor temperature

leads to delay for the cooling process of the indoor. This delay prevent building from being cool in the hot and humid seasons. In this region, the materials with less thermal capacity and less thickness provide more proper reaction to the climatic need and brick is not preferred for the mild and humid weather. Maybe, the architect preferred brick to other materials such as wood, due to its higher durability and pressure tolerance toward the heavy materials used for upper floors, roof and decorations. The width/length ratio in openings is 1 to 1.6 on the east side, 1 to 2.3 on the west side, and 1 to 2.3 on the north and south sides. It seems that the architect didn't compensate the thermal behavior of the brick, especially on the north and south sides, by using openings and windows.

In the architecture of urban houses in Gilan, spaces

are divided into two main categories: 1. Pause spaces where the residents spend most of their time in them and provision of adequate light and draught was emphasized in their plan and design, and 2. Movement spaces which have a little life and don't have enough light and draught. These kinds of spaces are generally services, located in the center of the building and have no significant share in the facade. According to what mentioned above, Sadeqi's

house has the following four space categories:
 1. The spaces of the first category are located on the first floor and include porch and alcove. According to their location in the center (intersection of two longitudinal and transverse axes), we can understand the significance role of porch in the climatic behavior of the building and the type of decorations. These spaces are considered pause space (Fig. 14).

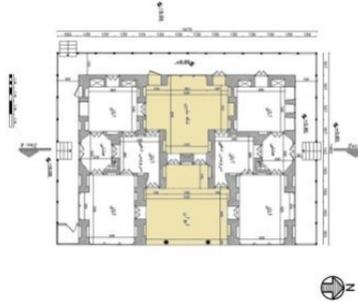


Fig. 14. The First Category of Spaces

2. The spaces of this category are located on the first floor and include some rooms which have appropriate light and draught because of their good locations in the building. They are supporter of the spaces in the first category and

have significant role in the building, because they are daily used by the residents and considered as pause spaces (Fig. 15).

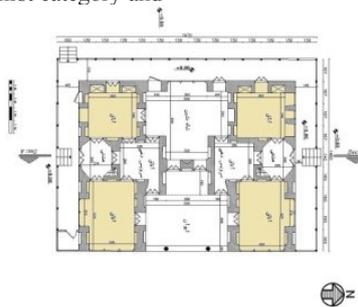


Fig. 15. The Second Category of Spaces

3. The spaces of this category are also on the second floor and don't have natural light and appropriate draught. They are located between the spaces in the first and second category spaces. They have many doors in order to make it possible to connect the spaces. These doors makes

it possible to provide air rotation and breeze in the hot seasons, so they are important in the design of building because of the provision of spatial connection, and that is why they are called movement space (Fig. 16).

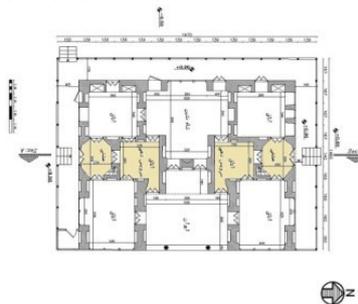


Fig. 16. The Third Category of Spaces

4. The spaces of this category are located on the second floor and don't have adequate light and draught. The dimensions of these rooms, their less decorations and their accesses show the less importance of them. The residents used these spaces for relaxing and some services. These spaces are considered as pause spaces (Fig. 17).

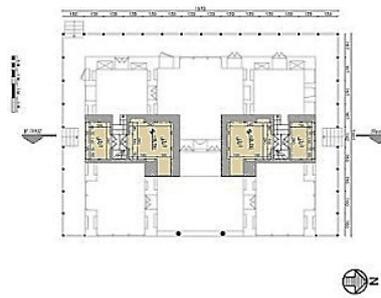


Fig. 17. The Fourth Category of Spaces

Symmetrical plans and facades are seen in the building. There is an axis and the elements are correspondingly placed on both sides of it. There are also some axes which divide the factors in terms of weight. The building has a

symmetry in both plan and western and eastern facades. The plan is symmetrical around the east-west axis and it is along the elongation of the whole building (Fig. 18).

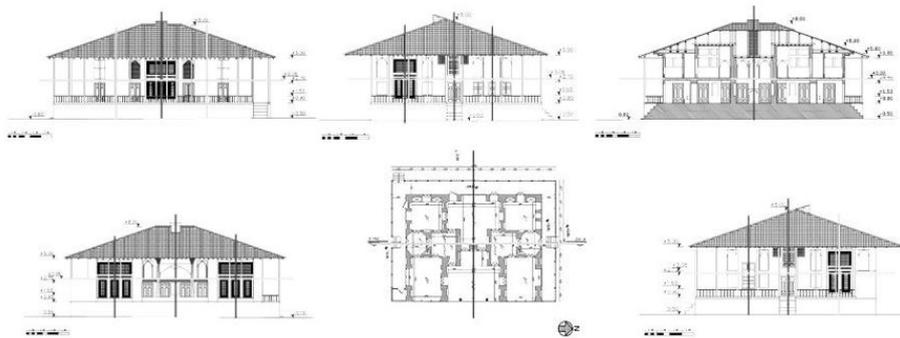


Fig. 18. Plans, Facades and Interior Facades (Rooms), Empty and Full Spaces and Symmetry of Them

The eastern façade of the porch has different kinds of decorations but the side facades, i.e. northern and southern facades, have fewer decorations because they are less visible. Under the roof, the painting, as collage on the paper ground, is pasted to the wall. On the margin of the alcove's ceiling, the architect uses the motif of flower, bird and boat which are the characteristics of Qajar art. The porch opens to the alcove through two doors, indicating

the change in pattern from the Safavid pattern (openings used in odd number) to the Qajar pattern (openings used in even number). There are two valuable wooden columns in the east façade which support the roof of the porch and they are made of the wood of *Zelkova carpinifolia*. People in Gilan respect this kind of tree because of its holiness. This justifies the use of columns made of this type of wood (Khakpour, 2017, p. 6) (Fig. 19).



Fig. 19. Various Decorations in the Porch (Southern Wall, Entrance of Alcove, Column, Collage on the Margin of Eastern Wall)

In the process of building the Khafang (type of cornice) of the doors, wooden Gereh were used, plaster flower and bird are also seen on the margins of the false arches on the

northern and southern sides of the porch. One of the two birds is a hoopoe moving around a flower. This kind of painting is influenced by the Safavid art (Fig. 20).

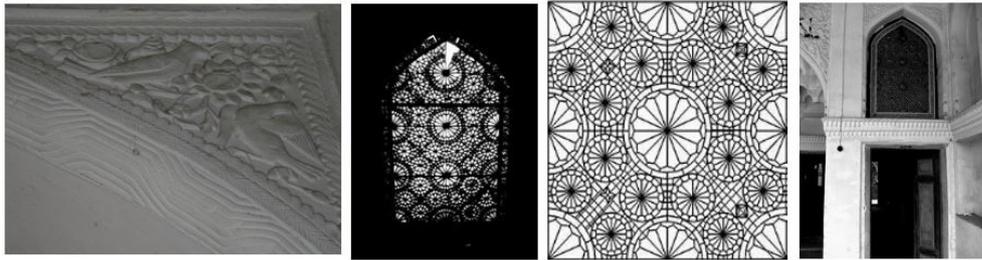


Fig. 20. Views of Gereh on Khafang in Porch and its Plastering

There are Muqarnas and arabesque motifs on the upper part. There are also plastering with the concept of Simurgh on both sides of the Muqarnas in a symmetrical way. Different kinds of birds were used in the center, and vine,

red roses, amaryllis, hundred-leaved roses on the margin. These plastering are shown in a row on the upper part (Fig. 21).



Fig. 21. Plastering in the Porch

Sash windows are used in the eastern and western parts of the building. These windows are included different kinds of wooden Gereh composed of Shamsheh 6 and 8. The sash

window in the western side has more decoration than the eastern side (Fig. 22).



Fig. 22. Interior Views of Sashes and Magnification of Shamsheh in the Sash of Alcove

The decorations on the doors of the alcoves included crimson paintings covered by varnish, with the concept of flower and bird. These flowers are such as: hundred-leaved flowers and Irises with different colors. Birds are

unanimated and the flowers are located on the visual symmetrical axis. The advent time of these motifs in Qajar period shows the effect of this style on the art. The studs on the door are metal (Fig. 23).



Fig. 23. Views of Flower and Bird Motifs on Doors of Alcove and Interior and Exterior Door Fittings

The heating system on the wall is composed of the two-piece stone and on its below margin, the following verse was carved:

Look at the flames of the fire, which make the hunting birds to whimper.

Where hunting birds is a metaphor of valuable plastering

of flowers and birds on the upper margin of the heating system. It seems that this work was painted later considering the self-colored decorations in the building. The design of this part is affected by the Qajar patterns because the flowers are located around a symmetry axis in the mentioned art work. Flowers and birds don't have any special identity in this building (Fig. 24).



Fig. 24. Location of the Heating System and Plastering of the Upper Part

9. CONCLUSION

Most of the important elements in the structure of the building, which were closely related to the climate of the region, had been changed or deteriorated by the advent of Qajar architecture to the humid region in the north of Iran. In the present study, the effects of the Qajar architecture on the climatic architecture of Gilan was investigated. Studying Sadeqi's house has two main part as follows: architecture and decorations. In both parts, professional artists were applied to build them and this ensures the durability of the building. In the first part, i.e. the main body of the building, the combination of different empty and full spaces, i.e. rooms and the porch show that the building doesn't obey the four patterns and even obeys the latest pattern with the construction of central porch, which seems not have proper climatic function. The climatic efficiency of the porch in this building seems proper because of its depth caused by the ceiling protrusion which leads to increased air suction and directs the wind into the alcove. It seems that, the architect tried to change the import pattern and optimized the pattern. Choosing the brick, due to its thermal behavior, needs to provide the adequate openings on both north and south fronts while the architect was careless in this regard. This is confirmed considering the opened surfaces/closed surfaces on the body, especially on the northern and southern facades. It also seems that there wasn't any

balanced for the number of the windows because of the lack of enough knowledge about the temperature and humidity.

This building is not completely in accordance with the common Qajar architecture of that time. This can be observed with the non-centrality of the building and the appearance of stairs in the main façade. The stairs full of decorations show the importance of social position of the owner of building and his communication with rich people and political men. This is not observed in Sadeghi's house. Same as other buildings in the Qajar period, in this house, the following materials were used: mud, stone, glass, wood, pottery and lime. Roof was made of clay and the walls are made of bricks and covered with lime and sash windows were used in them. The hexagonal column and attention to petals are the characteristics of Qajar architecture, which enhance the inviting aspect and increases the life of watching the public places like porches and alcoves. Other parameters in this building are the appearance of two-door space and rectangular and square pools. There were two kinds of decorations in the houses of Qajar period as follows: Volumetric decorations like Muqarnas and Rasmibandi and flat decorations like plastering, painting, Āina-kāri, brick works and sculpture. Other decorations of Qajar period are sash windows, niches, doors with the paintings of birds and flowers and even sculpturing (Table1).

Table 1. Comparative Study of Sadeghi House Architecture in Both Safavid and Qajar period

Sadeqi House	Building Location	Wall	Roof	Base Course	Porch	Column	Stair	Number of Openings	Pool	Sash	Plastering	Painting	Sculpturing
Climatic Architecture			*	*	*								
Safavid Architecture							*				*	*	
Qajar Architecture		*				*		*	*	*	*	*	*
Unknown	*												

According to table1, it is found that the buildings in Gilan have been gradually affected by Qajar Architecture. Qajar architecture with many decorations was so attractive for people who had an architecture with limited decorations of woody materials. Studying the elements in Sadeqi's house shows that the architecture of urban houses in Gilan, instead of

being completely influenced by a type of architecture with many signs of pretending to be proud, tried to combine the climatic architecture of Gilan with Qajar architecture. Later, the climatic architecture lost its importance due to the pervasiveness of Qajar construction patterns as well as later techniques.

END NOTE

1. The semi-open space like porch which is built in front of the entrance and separates the access space from the passage.
2. Single-core including one residential place and two-core including two units with separate parts.
3. Small shelves which are built on the top of the main shelves and it is a place for plastering and Āina-kāri.
4. Thermal capacity is an amount of heat that each unit of mass needs it to increase its temperature by 1°C.
5. A kind of wooden skeleton which helps to build the roof with pottery.
6. They use the pottery without using the mortar and just fixed it by clay and lime.
7. This a kind of brick which is shaped before baking.
8. This is a kind of window which opens along the vertical axis and it is used for decorations.
9. To laminate the roof with wood: this leads to each shelf to locate in front of the other. This technology, in addition to lengthening of the wooden bar of the envelope, increases the length of console and prevents rain water to reach the walls (Khakpour, 2013, p.91).
10. This is kind of vestibule that is like a rectangle with four chamfered corners.

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