

The Introduction of Indigenous Architectural Form of Sanandaj's Houses (Case study: Ahmad Zadeh's House)

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Abstract

The main feature of each region and country is its indigenous architecture, and, in Iran, distinctive climatic zones, varied climatic conditions, and different ethnic cultures have brought about diversity in architecture. One of the symbols of sustainable architecture is traditional Iranian architecture in which built according the lowest negative impact on the environment. The indigenous architecture of any area is driven from factors that have human, natural and ecological aspects, which effectively influence on history and civilization, culture and identity, climate, religious, belief and political issues in the field of the indigenous architecture of any city and region. Sanandaj has magnificent and beautiful monuments and most of it is related to the Qajar period, which is comparable in terms of design and style with the style of Isfahan style, and its architecture relates to the position of cold climate regions. With regard to the indigenous architecture that is the subject of the indigenous form of Sanandaj region, this research is a special kind of architectural occurring that has specialized in this issue, which has not architecturally been addressed until now. The research has been conducted based on the qualitative approach and the reviews of case studies, as well as a bibliographic studies, and various reporting tasks. At the end of this writing, researchers have concluded that the indigenous form of region, which has a small urban spaces and enclosed, dense urban texture and the buildings joined together, the direction of the Sun, and earth accidents are the determinant factors in the building settlement, the main thoroughfares and alleys, built parallel to the ground level line with low width, and has influences, such as the expansion of the overall profile of the city, as well as the lack of penetration of cold in the building, and also affects their life style. Also based on the obtained results, the components of the current architectural indigenous form of the region can influence on sustainable architecture and optimal energy saving.

Key words:

Indigenous architecture; the House; sustainable architecture; Sanandaj.

1. Introduction

The city of Sanandaj is the center of Kurdistan province, and the third most populous Kurdish cities, which is located in the West of Iran. The word of Sanandaj is originated from the word of "Sane" that in Avestan (Kurdish) language means "Seqr", which is a bird smaller than Eagle, later it

was changed into "Sna Dej" (Sne Ghaleh), and today is reputed to Sanandaj, which is an Arabic word. The emergence of settlements in the city dated back to the third millennium BC. Monuments form of Kurdistan region before Medes corresponds to the era of Aorartos (Hevetukan) that are heavy and dark-colored stone buildings with wooden beams covering. Aorartos are current Turkish Kurds. Medes who had a good relationship with their neighbors, Sumerians (current Iraqi Kurds), could learn their techniques within a short period, and established Iran's first Empire in the West of Iran. The shape of the Medes architecture is often in form of crypt and tomb that were created in the heart of the cliff, and has been decorated by carving the mountain stone with columns at its entrance. After the overthrow of the Medes, the capital of Kurdistan was transferred from Hegmataneh (in Kurdish Helmetane), or today's Hamedan, to the Bahar city of Hamedan, and later moved to a city near the scene. No regular rule creates a small local governments around the Sanandaj that this weakness ended in Safavid era. Current city of Sanandaj was re-established in Safavid era during the reign of Shah Safi by Suleiman Khan Ardalan, the governor of Kurdistan who was from Isfahan, and The small fortress of Hassan Abad, Palngan, Zalam, and Marivan were transferred to Sanandaj and a strong central government was formed. Ottoman government greed over Kurdish territory for conquering made the Safavid specially interested in Sanandaj as the capital of Kurdistan province. This led to the presence of Isfahan outstanding artists and architects in this city and therefore Isfahan style architecture, which was compatible and compliance with the Kurdish region, have increased dramatically in the city and magnificent buildings were built, such as the Kohan Dej and its inside buildings and Sanandaj market with a rectangular plan that is dominated by the architecture of market around Naghshe Jahan Square in Isfahan. Probably one of the most beautiful Chaharbagh that were made in Iran after the Isfahan Chaharbagh, was Sanandaj Chaharbagh in north of the market. This Chaharbagh became Chaharbagh residential neighborhood in Qajar era. The impact of Isfahan architectural style continued in both Zand and Qajar periods

¹ Persian garden designs where perpendicular passages divided the garden into four equal parts.

and Chaharbagh Khosroabad mansion, which is another beautiful Chaharbagh in Iran, were appeared in the texture of Sanandaj.

Form means the original configuration and framework and in architectural term refers to the style and techniques in the design and structuring of a building. The form of indigenous monuments in Sanandaj is driven from the cold and alpine climate as well as the cultural and traditional elements, and forms and techniques of full ornament architecture dominated over Iran, which at that time was architecture of the Safavid era combined with the style of Isfahan, have formed the oldest monuments left in Sanandaj. Due to political factors like war and atmospheric factors such as floods and earthquakes, the city has been destroyed several times in history, and for this reason the oldest sustainable architecture in the city of Sanandaj is related to the Safavid, and the noblest architecture of this kind is the Great Mosque in Sanandaj.



Fig. 1: Aerial image corresponds to the year 1958 (geographic organization of the armed forces, 2007)



Fig. 2: Khosroabad Mansion (Tourism & Cultural Heritage of Kurdistan province, 2017)

The indigenous architecture of Sanandaj houses is made up of materials such as raw clay, mud, plaster of clay & straw, stone, wood, and brick, and is in the form of the central courtyard with flat roofs made of wood and Lambe tattoo.

In the Qajar era, roofs were in form of metal canopy gable roofs. Today, over the years, the indigenous architecture of Sanandaj, as other cities, is declining and only a few indigenous architecture buildings have left. that it can be pointed out to Kohan Dej (Government fortress), market, mosques, baths and various monuments in Sanandaj, as the center of Kurdistan (by Suleiman Khan Ardalán, the Governor of Kurdistan). According to the most recent books, most urban construction has been done at the time of Amanullah Khan, the Governor of Kurdistan. He has built several monuments such as the mosque, bridge, square, and the market. Englishman Rich, on a trip to meet with Amanullah Khan, used the phrase of melancholic for architectural constructions (Rich, 1983, 216) that Ayatollah Sheikh Muhammad Marduk Kurdistan House, Pirmoradi House, Ahmadzadeh House, Sanandaj husbandry house, Mojtahedi House, Meamarbachi House, and noble and beautiful mansions like Salar Saied, Khosroabad, colonel Azmodeh Ardalán, Amjad al-Ashraf, Vakil al-Molk, Asef Vaziri, Moshir Divan, Sheikh Mohammad Bagher Ghiyasi, Mola Lotfollah Sheikh al-Islam, and Molk al-Tojjar mansions are some of these constructions.

Traditional house patterns are suitable to use and save energy, so that old houses in Sanandaj have a central courtyard and rooms on the north side of the courtyard are bigger and wider than other parts. The living room has been placed in the same position due to use of direct radiation and heat of the sun in the winter, and the rooms at the south part are less used in summer. If there are Eastern and Western rooms, they are used as stock or service spaces such as the kitchen and bathroom. Most of these houses have basements with a short roof in winter-sitting part where due to being relatively cool is used for family residence in summer. Since the weather is most often cool in the year, all everyday activities take place inside the rooms, therefore yard are is smaller than the central plateau regions of Iran, and the depth of patios is also even lower than the southern areas of the country. In most cities of cold regions, the floor of the courtyard is one to one and a half meters lower than the sidewalks that this makes maintaining the heat inside the building. The basement acts as thermal insulation around the house and prevents heat exchange between the building and the surroundings. In these areas, buildings are in form of cube and cuboid that the ratio of the outer surface to the inside of the building is low, and is appropriate to these regions (Ghobadian, 1998, p. 104).

2. Methods

The method of this research is qualitative and based on case studies, as well as bibliographic reviews and various reporting affairs.

Background

Mahan and Rafiee (2014) in "review of the principles of sustainable architecture in the traditional architecture of Khoram Abad (case study: House of Mullah Abu)" suggested that indigenous and traditional architecture and its adaptation with sustainable architecture in terms of various aspects of sustainability and due to its oldness in the very ancient ages, which successfully passed different tests during centuries, can be a good pattern to achieve sustainable and popular designs. This article introduces the climatic conditions of the Lorestan province to investigate the formation of specific architecture of this area that is compatible with this climate, so as to design current buildings as well as to approach housing and residential spaces in these areas closer to human comfort range, and finally to provide the possibility of saving nonrenewable energy resources, by complying with these principles. In this article, the House of Mullah Abu located in Khoram Abad has been explored in terms of economic, cultural, and environmental aspects. Effort is made to step effectively forward in confronting the blights faced by them from various aspects by recognizing this type of residential buildings and discovering the origins of their architectures and capturing these patterns, in line with the recognition and introduction of indigenous originality and reusing them in rearrangement of contemporary architecture. Data collection has been done in a documentary-field approach, and they are of descriptive and analytical type along with a case study in research method. The hypothesis of this research was that with regard to the climate and its impact on the formation of the indigenous architecture in Lorestan province, we can see the popular and climatically compatible architecture, or some sort of sustainable architecture in these areas. The research findings are indicative of the attention to the values and characteristics of traditional architecture as an appropriate model for achieving plans of sustainable architecture.

Molanaei, Sabetghadam, & Ghaslani (2015) stated in the "Physical Contextualism in Indigenous Architecture of Ghatarchiyan District in Sanandaj: the Confrontation of Old and New" that contextualism considers context as a historical event within which architectural elements are known and made. The aforementioned perspective first noted merely to physical aspects, but gradually turned to the human aspects, and extended the scope of its studies to the social-cultural aspects of community. In this view, the ideas and elements of cities in the past are involved in forming contemporary cities. So contextual architecture should be able to find a location features and make it as a part of its design process. Contextual architecture emphasis on field-orienting and align between space and environment, and takes shape by understanding the message of its substrate and, in fact, it objectifies and designs the message moved to it by its architectural substrate, resulting in the building be a small minor peripheral nature. Ghatarchiyan district is one of the oldest and most important quarters of Sanandaj

characterized by high population, special topography as well as the existence of valuable monuments that still plays a major role in urban operations. Lack of attention to these valuable treasures, buildings, and historical textures exposes them in the risk of destruction. In this paper, firstly Ghatarchiyan district contextual architecture studied and then its physical field and site specific conditions were examined through the study of its historical background and formation as well as case perceptions of the monuments in this district. Research findings show that architects can use a list of criteria and patterns to confront the new architecture with the old one with respect to building with a valuable context, such as the improvement of the strong and clear visual features in form of conflict, homogeneity, or the confrontation which used in the design of the new buildings. Khodakaramzadeh and Tahmasebi (2015) suggested in "Review the Historical Texture of Districts and its Impact on the Promotion of urban identity, case study: Ghatarchiyan district in Sanandaj" that today's, identity and residential patterning issue is a concern that sometimes is discussed and criticized with no emphasis on detailed studies. Among the diverse experiences that have achieved on the country's architecture, it seems that the Iranian architecture benefits from more secrets and mysteries and combines buildings responsive to the needs of everyday universal City residents with each other. The original Iranian architecture is combined with an identity that its unity and continuity has been rich in all the elements leading up to cultural circulation and development. This issue was clearly understandable in past eras that exhibited the continuation of the history as a full length mirror of the culture and civilization of this land. Kurdistan province and the city of Sanandaj is an alpine area, which is located in the West of Iran. Sanandaj has an old and worn out tissues, and it is essential to pay more attention to the renewal and revival of the historical context in all areas based on the normative interventions. In this paper is presented the role of identity in the revival and vitality of historical textures, with an emphasis on rehabilitation and renovation of the historical context of Ghatarchiyan district in Sanandaj as a case study, to propose strategies, policies, and views in order to identify these tissues. This is done because the cultural and historical identity and continuity of the urban memories for future generations come to create and they raise as indigenous, local and national honorable documents.

Research question and hypothesis

According to the reviews and opinions offered regarding the type of architectural practices of Sanandaj and also subjects reviewed by other researchers, this research question and hypothesis are proposed as following: According to climate and other effective components on the type of the architecture, what is the form of basic structure of architectural form in terms of either plan or surface? And also, has this trend continued in the contemporary period?

It can be acknowledged that, with regard to the various issues that influence on the type of architecture and the architectural development and growth, this trend can provide the a better architectural product through updating and adding modern technology. The researchers believe that by examining these issues in the traditional architecture in Sanandaj and also reviewing its reasons, they can find how we can consider the present architecture as the continued form of that architecture and also as a subject to enhance it.

Thematic articles

The architecture of Sanandaj city

Topographical status of the town and the surrounding mountains cause the city naturally encloses in a relatively flat valley, and indeed the formation is extended in other ways. As well as the formation of major and minor streets and roads network, alleys, and neighborhoods is based on the slope of the ground, and even most parts of the city (buildings) have been established in forms of stairs and terraces and, with the exception of restructured districts, most of alleys are narrow, winding, and in form of stairs. Based on the available evidence, Sanandaj (sane Dej) is one of the holy and ancient, associated with the Zoroastrianism, cities in Iran. The relationship between this city and its neighboring areas with Iranian heroic myths such as Toosh Nozar Hill, indicates its importance and oldness. Geographical location of the city, right next to Dareh Bayan and Kishlak Rivers, and locating in the mountains with a nearly perfect height, have been very reasonable in city positioning. The existence of Hassan Abad Castle and the castles such as Zagros, Babariz, and Salavat Abad, which probably dating back to before Sassanid period, near Sanandaj have existed as boroughs or villages afterward until the Safavid reign (Ayazi, 1992). Cities in Alpine regions were built in the middle of the foothills and on the South side for some reason, including: (a) if the city is at the bottom of the valley, there will be the risk of flood and destruction; (b) At night, the cold air that is heavier, penetrates to the bottom of the valley, and dominates over it, which in this case the coldness of the city is intensively increased; (c) The north side of the mountain that is always in shade and cold, it is not a good place to live; (d) Top of the mountain is not suitable for the establishment of the city, because this location often is more uneven and, most importantly, the wind blows hardly (Rezaei, 2005).

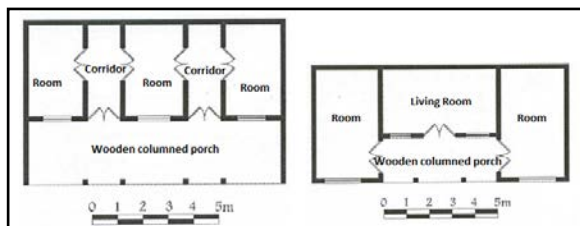


Fig 3: Houses' maps in Kurdistan region with rooms and patio in front of it (the author, 2011)

Indigenous architecture

According to Paulo Leor's definition of the indigenous architecture, it is a species of architecture that grows within the communities, and, during this process, it evolves and reconciles itself with climatic, social, and technological conditions, and it is compatible with values, economy, life styles of cultures resulting from them, or in short, the indigenous architecture is the architecture of and through, not for, people (Noormohammadi, 2009). Italian architect Pietro Bellucchi defines indigenous architecture in this way: native art is a type of art that is not made by a small number of specialists and formulated program, rather it is formed following the activities of all experienced people with the same history (Heritage) and in the limited scope of ordinary people experience (Rudofsky, 1974). Every nation that is founded its own architecture, has displayed its desired lines and forms, which have special features like its local language, habits and customs. Before the collapse of the cultural boundaries that occurred in the nineteenth century, forms and special elements of indigenous architecture can be seen in all the world. The building of each area is an amazing product of propitious link between people imagine with the demands of the environment (Fathi, 2003).

Indigenous architectural characteristics of Sanandaj

Two species of architecture can be identified to the West of Iran affected by climate and geography, particularly the Kurdistan region. In the East of the province, which is an even plain, more rural and urban houses have a yard in the center or one side, but their architecture is extrovert. The West of the province has stepped architecture due to the topography and roughness. The development of the Sane village and its transformation to Sanandaj under the order of Shah Safi in 1046 A.H. (Sanandaji, 1987, 122; Kurdistan chronicler, 2002: 32; Ardalan, 2005: 71; Babani, 1998:46; Marduk, 2000:276-277) caused native and stepped architecture replacement by the architecture of central region of Iran in this city (Zarei, 2013, 111). However, the Houses of the settler Lords and native ones in the region were built in introvert architectural style within the central area of Iran, especially Esfahan style (Zarei, 2007, 156).

A space as the nave and a wooden porch column is used in the region's indigenous architectural style that is incorporated at the front of nave with columned porch. Since a long time ago, this style adapted with the climate of the area. The columned porches were used to avoid entering snow and rain in contact with windows and doors in winter and generally rainfall and snow were prevented from entering the rooms whose architecture was extrovert. This was also a perfect canopy in summer to relax and avoid direct radiation of the sunlight into the spaces. This space, with a little difference, is also observed in Abyaneh and the

surrounding areas, titled "pre-hall" 1, and is located at its whole front part, and made a kind of coherence in the view of the House (Memariyan, 1992: 281). The porch has existed in the architecture of Isfahan Houses in Qajar period that is referred to as Kurdish home or the home with the alpine regions pattern whose two winter- and summer-sitting sections place on top of one another. The building form has been designed and implemented based on the climate of the region and to cope with the extreme cold. So that the overall properties of the building form in these areas are as the follow: (a) buildings with a central courtyard and introvert; (b) the ratio of the external shell surface to low volume of building; (c) the low height of the rooms; (d) flat roofs; (e) small and low openings.

Case study: Ahmadzadeh mansion

This historical building, which was built in the early Pahlavi period and its area is about 2000 m², This is the historical period of the early Pahlavi period it belongs to and is an area of about 2000 m², consists of 500 m wide and 1400 m² side and superstructure that is built in four floors with Iranian architectural design and method and influenced by the architecture of Azerbaijan with local materials. It is the result of the work of Sanandaj craftsmen and overseeing of the late architect Mirza Mahmoud Ghaffari, and especially the innovation of Mr. Asghar Mousavi brick maker and the Fereidouni bike kiln, and their creativity and attempt in brick-cutting and view-making industries, and landmark knot arrangement, observing the principles of symmetry and balance, and the balance in construction. It also now attracts professionals, architects, and visitors attention as one of outstanding monuments of this region and observing stability and stagnation principles with traditional materials, as well as its consistency, strength and beauty. In this case it is necessary to mention a casualty of the Iraq war, in which it was attacked by Iraq bombers so that most of its neighboring houses generally destructed, but mentioned building remained standing and still maintained its stagnation and only a little part of the gable roof and the upper porch briefly damaged and later was repaired by the owner of the property. While making this building, the tissue of Aghazaman neighborhood was compressed, and with intensively narrow and difficult to pass alleys. However, the motivation of building such a structure is worth to study.



Fig. 4: Pictures of the House of Ahmadzadeh

Architectural elements in this building are as follows: courtyard, waterfront, reception hall, pond, terrace, barn, kitchen, small bathroom and sanitary services, and green space, the performance of the geometric motifs-arched building-column and projecting pot, and plant and Aslimi motifs and the performance of arch and the full of pictures arc-fifty seven half-circular- arc and sector (of a circle) and throne. This building, as mentioned, was not significantly damaged in Iran-Iraq war, only a part of terrace gable roof that was later repaired by the owner. The building construction date back to the Pahlavi period, and it is not old so much thereby does not undergo much damage and also has not structurally any specific problem. One member of the Ahmadzadeh dynasty mentioned some clear points about this mansion as the following: a) There are plenty of fruit trees in the front courtyard of the mansion; b) the use of irregular paving between which there has been the grass; c) lack of pond that has already been made; d) Deterioration of the wooden parts of the roof, which was made from soft wood; e) The deterioration of domestic sirloin and niche; f) The destruction of the Interior mansion floor mats. Apart from the mentioned issues, due to the high humidity, moisture penetrates to the ground walls and causes the walls decay.

The building denomination can be explained as the following: Mr. Mirza Mohammad Saleh Ahmadzadeh was born in 1905. He had four sons named Mohammad Ali (deceased), Mohammad Sadiq, Mohammad Bagher, and Mohammad Jafar, and three girls named Ferashteh, Ghashangi, and the Mahmonir. He purchased three tracts of land in Aghazaman district at 4480 Rial price in 1934. He accomplished to build a home, which has particular architectural characteristics, in 1943-1946 (different opinions in this regard is provided). Mr. Mohammad Saleh Ahmadzadeh died in 9/29/1999, and the aforementioned House is now owned by the decedent's heirs.

¹ In Persian, Talar pish

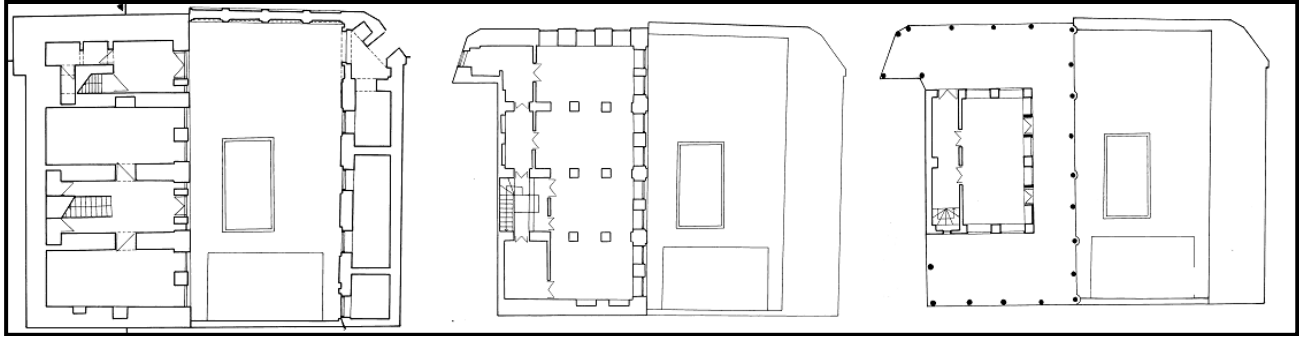


Fig. 5: Ahmadzadeh building plans (Cultural Heritage Organization of Sanandaj, 2016)



Fig. 6: Views and sections of the Ahmadzadeh House (Cultural Heritage Organization of Sanandaj, 2016)

Pathology and degradation factors

1. Social factors and incidents

These kinds of incidents happened during the residence, and perhaps religious beliefs had a great influence on the changes in the building. Currently the building is owned by the proprietors and one of the grandchildren of Ahmadzadeh who is one of the cultural heritage staffs, lives in the building. Something that can quite clearly be seen by every viewer is one of the vertical narrow windows, which is filled with brick (social damages), and creates an ugly view has on the ground floor of the building. In this building, fireplace had a particular place and some ducts lead the smoke of this fireplace to the outside. Over time and with other people living and closing these spaces, there was a need for a chimney, but unfortunately the departure of chimney from one of the windows' glass causes the destruction of frontage. At that time, Ahmadzadeh family did not much attend in this building and according to one of his grandchildren, they reside in a home in Tehran, and often use it in summer. In terms of the plan of restoration of the monument, one of the roots of social pathology is the personal style in internal design of the mansion. According to one of the people in the region, the false ceiling the wooden collection was uniquely beautiful and several documentary program have been produced from the old roof of this building.

2. Factors related to lifestyle

tenant resident and the lack of commitment of tenants in this building and in addition, the dispute over its ownership among building proprietors and cultural heritage organization cause the unfortunate damages. In this case, that part of the building that is owned by one of the proprietors is completely separated from the part owned by cultural heritage organization via a wrong walling up, although all parts of this building are sequentially interdependent. Also, for example, a staircase from the ground floor to the upper floors left useless due to the closure of the entrance at the first floor, whose owner is the proprietor, and this leads to destroy and exhaustion of this beautiful staircase. Also on the ground floor, due to not using of the old bath of the building, this virtually has been converted to garbage accumulation and storage place and for the ground floor it approaches to completely exhaust. The ground floor of the building, which is possessed by cultural heritage organization, has been assigned to one of its personnel, which despite the expectation it unfortunately does not take carefully into attention.

3. The destruction factors by people and governors

a. Destruction by people: Unfortunately, this has become as a kind of worthless value that we want any beautiful thing for ourselves at the price of destroying nation's cultural heritage and historical certificates. The

building has also like other historic buildings, its own beauty that is unique in its kind. There are beautiful and painted woodworking and brickwork that intensively attract the pirates of historical works. According to being partly empty and abandoned for years or even at the time of reconstruction due to lack of attention and care of very beautiful components of building, many of internal devices of the mansion or even wood-work and wooden parts used in false ceilings have been lost. This is the case in a situation that we all acknowledge that internal decorative means, tableaux, and sculptures are inseparable parts of a mansion and their separation are absolutely not acceptable.

b. Destruction by the governors: This building, like most buildings with more or even less life than it, is either unintentionally or intentionally damaged within a specified period of time. In this period of cultural invasion, due to lack of necessary proficiency and making expertized decisions, and a lack of commitment of provincial officials, many of this building was less taken into attention and it was considered as a spoil of war. Lack of paying attention to the needs of the preservation of historic buildings, construction decisions, separation of the city, and the issuance of building permits around leads to create a kind of choking for building.

4. Natural factors

These damages include rain and snow precipitation, earthquake, flood, heterogeneous subsidence of the foundation due to weakness of some parts of the soil and so on. The destruction of some bricks of the building was greatly resulted from the rain. Lack of appropriate eaves to prevent the pouring rain and the snow on the walls was one of the reasons for the deterioration of the building bricks. The building has partly subsided and perhaps one of the important reasons for this is the use of large rock fragments have been under the foundation. Due to the deterioration of drains, sometimes rain poured on the walls of the building and washed away sections of the building. Currently down the drain pipes that are left at a height of two meters of land, fluxing water on the bottom of wall has a large destructive impact. Penetration of rainwater into the ground causes excessive moisture transferring into the foundation. If possible, a proper drainage is necessary to prevent moisture penetration. At the entrance, staved roof has been reconstructed by using the exciting textures of the building by cultural heritage organization, and also the sanitary services at the entrance has been removed.

5. Conclusion

Kurdistan has two distinct topography that is why the native form and plan have the potential to create sustainable

architecture. In the East of the province that is an even plain, most rural and urban homes have a courtyard in the center or on one side, but their architectures are extrovert. West of province has stepped architecture in terms of topography and roughness and Sanandaj is a combination of these two types of architectures. Sanandaj has small and large hills in the flat lands and the city is surrounded by high mountains. Ghatarchiyan neighborhood, such as East of the province, has a courtyard in the center, and the Taghtaghan neighborhood has stepped architecture. The indigenous architecture of Sanandaj houses is made up of materials such as raw clay, mud, plaster of clay & straw, stone, wood, and brick, and is in the form of flat roofs made of wood and Lambe tattoo. In the Qajar era, roofs were in form of metal canopy gable roofs, which is, as other cities, lost and declining and only a few indigenous architecture buildings have left. It was better that it was merging with IT and contemporary architecture technology and was released as modern architecture. But unfortunately, this action is not performed and the monuments of Sanandaj city rated turmoil, and not only the traditional architecture has not being paid attention to but also only economic and visually aesthetic aspects is considered.

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