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Article

Heritage in Transition: Vernacular Architectural Patterns in Rural Iran

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Abstract: The transition from vernacular architectural patterns to current architecture in rural Iran has led to various socio-cultural and environmental problems in the last decade. This study explores the nature of this transition, which has been overlooked in the studies of vernacular architecture in Iran. Furthermore, this article contributes to the ongoing academic debate on the decline and transformation of vernacular architectural patterns in the context of modernization. It analyzes the forces behind the decline and rise of vernacular settlements in a case study area, the Salami region of the Khaf district in Iran's Khorasan Razavi province, by exploring how it is possible to reinterpret vernacular architectural patterns in the context of current architecture to utilize the new developments in rural Iran not as an obstacle but as an opportunity for improvement. To this end, this article explores vernacular architectural patterns in a case study area in Iran, supported by socio-cultural aspects and the environmental conditions of the region. This study conducts architectural and anthropological fieldwork on three vernacular houses in a case study area and uses participant observation and informal interview methods to understand the people and their interaction with their built environment. The findings of this article thus contradict previous studies on learning from vernacular architecture by shedding light on vernacular architecture in Iran as a system by demonstrating the inextricable links between different vernacular architectural patterns. Therefore, this study argues that to draw lessons from vernacular architectural patterns for current architecture in rural Iran, it is necessary to limit its communication concerning people's contemporary needs but not to neglect this communication completely.

Keywords: vernacular architectural patterns; vernacular architectural reinterpretation; vernacular architectural transition; learning from vernacular architecture

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1. Introduction

In the last two decades, modernization has strongly influenced the vernacular lifestyle and, thus, the vernacular architecture in rural Iran. This has led to a transition from vernacular architecture to a new building trend inspired by the central cities of Iran, which differs from vernacular architecture and is oriented towards the contemporary needs of the people. This transition led to some socio-cultural and environmental problems in Iran, especially by neglecting the vernacular identity and lifestyle of the region and its inhabitants, as well as its impact on other geographical areas such as Egypt [1], Libya [2], Saudi Arabia [3] and some other countries in the Middle East and North Africa [4]. According to Dabaieh [1] (p. 5) in Egypt, "global ambitions and socio-economic development are some of the factors behind inhabitants deserting their houses, leaving them to deteriorate or demolishing them to build new houses using industrialized materials. People are seeking modern living facilities which respond to needs that their desert vernacular houses sometimes no longer satisfy. As a result of these changes, centuries of accumulated tangible and intangible tacit knowledge is being lost."

As in other parts of the world, the rapid spread of this transition in some rural areas and villages that have just turned into small cities of Iran has broken the hierarchy of

adaptation in vernacular architecture, which over the decades has been adapted by the locals to the various socio-cultural aspects of the vernacular lifestyle in response to the social and cultural, behavioral and spiritual values of Iranian vernacular society [5]. This transition has had a detrimental effect on socio-cultural and environmental problems, as Iranian researchers repeatedly emphasize [6–8]. It has also created a gap between the region's vernacular tradition and its current architecture. Solving some socio-cultural and environmental problems by bridging this gap in rural Iran has been one of the main research goals of most Iranian architectural scholars in the last two decades.

In terms of socio-cultural aspects, the loss of 'identity' in architecture is the major concern that has been highlighted by Iranian researchers and has led to a discrepancy between the sense of belonging, culture, traditions and lifestyle of people in rural Iran. In terms of the environmental aspects, 'excessive energy consumption' has been highlighted, which has led to environmental pollution, as the use of fossil fuels is the main source of creating human comfort in the new building trend in rural Iran. According to the Ministry of Energy of Iran, the energy consumption of current buildings, especially residential buildings, accounts for more than a third of the total fuel consumption in Iran [9] (p. 64).

However, the new quality of life offered by today's world cannot be overlooked, not even in rural Iran. So, how is it possible to reinterpret vernacular architectural patterns in the context of the new building trend to utilize the new developments in rural Iran not as an obstacle but as an opportunity for improvement? The study of vernacular architecture in Iran began five decades ago with an enthusiasm for the climatic perspective (around 1970) and then for the architectural typology (around 1980) of areas originally developed by schools of architecture and urban planning. Before 1986, there were few sources on the subject [10]. The first publications in this field commenced with two publications analyzing urban and architectural relationships in the hot–dry climate and the hot and semi-humid climate of Iran [11]. The first consideration of Iranian architectural typology was initiated in 1981 by two governmental organizations: the Islamic Revolution Housing Foundation (IRHF) and the Building and Housing Research Organization of Iran (BHRC). Both organizations have explained that their main aim in typological studies is to find suitable design patterns for today and future buildings. The functions of the building, the shape of the floor plan and the interaction of the building elements are the basis of typological studies in Iran [12].

Since then, numerous studies have been published dealing with various aspects of vernacular architecture in Iran, e.g., locations, climate, materials and patterns [13–15]. Most studies acknowledge that vernacular Iranian architecture is highly adaptable and takes into account various aspects such as the geographical, geological and cultural background and the lifestyle of the people [16,17]. As environmental issues and energy efficiency have recently come to the fore, especially in architecture, the focus of vernacular architecture in Iran has shifted primarily to its environmental sustainability strategies and patterns. Extensive studies have been conducted on this application to learn from them how to solve environmental problems, especially in the hot, dry climate of Iran in the current architecture of Iran [18–23]. On the other hand, the energy consumption of the current buildings in Iran has increased in the last ten years [9], although various studies have shown that it is beneficial to utilize environmental sustainability strategies and knowledge of vernacular architecture in current architecture to reduce energy consumption [9] (p. 1). This shows that earlier studies were used as a report or document rather than a massive practical application in Iran.

Therefore, this article contributes to the ongoing academic debate on the decline and transformation of vernacular architectural patterns in the context of modernization. It analyzes the forces behind the decline and rise of vernacular settlements in a case study area, the Salami region in the Khaf district of Iran's Khorasan Razavi province. This article contradicts the notion that one can learn from vernacular architecture in Iran only in relation to a single issue, such as its strategies and patterns of environmental sustainability,

without considering other related fundamental patterns that have characterized Iran's vernacular architecture.

In this article, vernacular architecture in the case study area is considered not only in terms of its environmental sustainability strategies and patterns but also as a system that encompasses all vernacular life patterns of people (such as tradition, culture, religion, beliefs, values, experiences, their interaction with the built environment) that have been shaped by the socio-cultural aspects of people and cannot be separated from each other. Rapoport also regards vernacular architecture as a model system [24]. According to him, it is impractical to consider the link between "culture" and architecture directly, as "culture" is not a thing but a concept (or definition), so different aspects and associations need to be assessed simultaneously [25]. This article examines the vernacular architectural patterns in the case study from a different and new perspective in Iran from two main aspects, namely during construction and use, underpinned by their socio-cultural aspects and the environmental conditions of the region. In addition, this article raises a new concern about the reasons for the transition from vernacular architecture to the new building trend by the people, which has been overlooked so far.

This article, therefore, examines, firstly, people's vernacular lifestyle patterns and their relationship to vernacular architectural patterns and, secondly, the reasons for the transition from vernacular architecture. To this end, architectural and anthropological fieldwork was conducted in the case study area to collect data through participant observation and informal interviews (conversations) with the locals in order to gain a deeper understanding of the people and their interaction with their built environment. This study, therefore, argues that all vernacular architectural patterns in Iran are interconnected like a system. In order to draw lessons from vernacular architectural patterns for current architecture in rural Iran, it is necessary to limit their communication in relation to people's contemporary needs but not to completely neglect this communication by looking at only one vernacular architectural pattern to learn from it.

2. Methodology

In order to achieve the research aim, a total of five weeks of architectural and anthropological fieldwork was conducted in the case study area from 2020 to 2023 to collect data through participant observation and informal interviews (conversations) with the locals to gain a deeper understanding of the people and their interaction with their built environment. In other words, to investigate "what architectural forms do rather than represent" [26] (p. 3) in the case study area. The methodological challenge of anthropological fieldwork for architecture, particularly in the study of vernacular architecture, has been repeatedly emphasized by architectural researchers such as Vellinga, Rappaport and Oliver [27–33].

Ten vernacular houses and five new trend buildings were studied through participant observation. However, three representative vernacular houses are presented in this article, which may reflect the current state of research. The participant observation used in this research provided rich qualitative data, images, drawings and interpretations of the vernacular lifestyle and architecture of the area, which enabled an in-depth understanding of the context of the architectural space of the case study area and its multiple interactions with the users and the environment. According to Kawulich [34], "Participant observation is used as a mainstay in fieldwork in a variety of disciplines, and, as such, has proven to be a beneficial tool for producing studies that provide accurate representation of a culture".

Informal interviews (conversations) with twenty local people living in the case study houses (ten people aged 50 years and older and ten people of the younger generation between 20 and 50 years) were used to support the aim of this research. In this research, the 'informal' conversation was considered as it allowed the locals to freely express their knowledge about the connection between their lifestyle and vernacular/contemporary houses for several reasons. First, the information gathered was not sensitive and focused on general preferences, daily experiences and opinions relating to their living spaces. Secondly,

the study followed an ethnographic approach where observations and informal conversations were essential for understanding the cultural and social meaning of vernacular houses in the case study area. In ethnographic research, obtaining written consent can be impractical and alter the natural behavior of participants, compromising the authenticity of the data [35,36].

3. Vernacular Architectural Patterns

Patterns are empirical rules that are communicated to humans on various levels through events in the world, and they reflect habitual behaviors and are based on the repeated experiences humans have had in different circumstances and on the doctrines of cause and effect associated with human experience and life [37]. In other words, what is called symbolic and enriches the human environment is related to individuals' socio-cultural and personal cultural values and influences aspects of people's behaviors [38].

In 1977, Christopher Alexander explained a theory in architecture, A Pattern Language, illustrating how humans are associated with architecture [39]. The architectural patterns of each area are unique to its condition, and neglecting them in new designs causes the loss of identity and decreases the design coherence [37]. Many researchers have also regularly highlighted that the secret to the success of vernacular architecture in creating a favorable atmosphere is considering patterns [40]. By preserving them, it is possible to conserve the vernacular culture [37]. Architectural patterns are inseparable from the social patterns of any territory, and their combination would create a higher level of socio-architectural patterns [37]. Architectural patterns are not just one factor, such as the composition of housing modules, floor plans or building materials and construction methods, but they take into account all these factors as well as other architectural components at different scales (from urban planning to the detail of a window [41]). The theory assumes that each component and scale has a pattern that repeats itself but is updated over time and retains its foundation. The key point is the connection of all these patterns at different levels, creating a vernacular architecture and the identity (sense of belonging) it contains.

The connection between different patterns of life (social, cultural, etc.) and vernacular architectural patterns must, therefore, not be overlooked if we want to learn from vernacular architecture for current architecture. This could be applied to vernacular architecture in Iran, where other patterns of life have influenced its vernacular and traditional architecture, such as its socio-cultural patterns, which have a decisive influence on traditional and vernacular architecture, as religious orders determine the everyday life of most people [42,43]. It should also be recognized that socio-cultural patterns evolve over time and that architectural patterns must respond to these changes, as the traditional and vernacular architecture of Iran has shown for decades. In other words, the patterns of traditional and vernacular architecture were updated to meet the new socio-cultural demands of their time until the speed of modernization approaches negatively affected this hierarchy in current architecture in Iran. Therefore, in order to learn from the different aspects of vernacular architecture, such as its patterns and strategies of environmental sustainability, all the vernacular lifestyles of the people who have shaped vernacular architecture need to be considered.

4. Case Study Area

Although vernacular architecture in different parts of Iran (e.g., Yazd, Kerman, etc.) has been studied from different aspects to learn from it, e.g., in terms of its environmental sustainability strategies and patterns [44], the vernacular architecture of Khorasan Razavi province (in the north-east of Iran) has not yet been sufficiently studied (Figure 1). Most previous studies for this province refer to its representative historical buildings (schools, mosques, etc.) by focusing mainly on a specific historical period (e.g., the architecture of the Timurid period (1370–1507 AD) in this region [45]).

Figure 1. This picture shows the map of Iran and the location of the Khorasan Razavi province in north-east Iran.

There are two fundamental studies on the typology of vernacular architecture in Khorasan Razavi province. In the first study, published in 1993, vernacular architecture in the greater Khorasan region of Iran (all Khorasan provinces; Khorasan Razavi, Central Khorasan, South Khorasan) was divided into three parts (north, center and south) based on the different climatic zones to show how the different spaces and floor plan elements were assigned to human activities according to the patterns that dominated them [46]. The second study, published in 2007, divided the vernacular architectural typology of the region into eleven types and aimed to find the most appropriate design patterns for the corresponding construction methods [47].

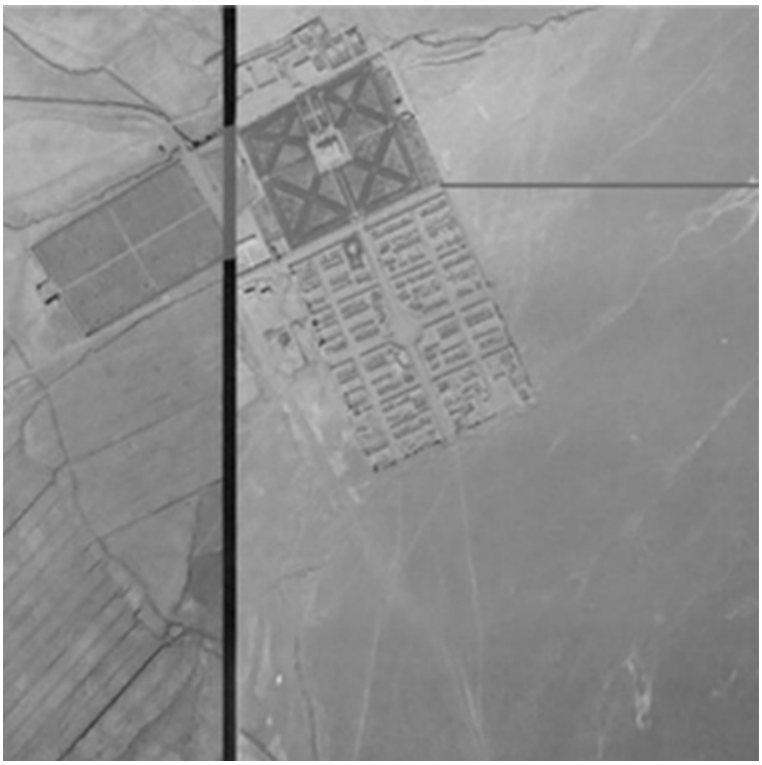
Although these two studies focused on the vernacular architectural patterns of the region to guide current architecture, the vernacular architectural patterns were neglected in current architecture of the region, leading to some socio-cultural and environmental problems. And the transition of vernacular architecture by people to the new building trends has also accelerated. In the Salami region of the province, for example, vernacular houses have increasingly been replaced by new building trends that do not take vernacular architectural patterns into account (Figure 2). In the last survey of vernacular buildings in Salami in 2013, less than 30% of the vernacular buildings (over 30 years old) were preserved [48], and this number has decreased significantly during the recent monitoring of the site.

The Salami region was chosen as the case study area for this study due to four key factors: First, the rapid industrial development in this region has dramatically changed the original planning of the area on various levels (Figure 3) and thus also the lifestyle of the people, e.g., by changing the occupations of most of the new generations. The inhabitants of the original core were farmers and were able to create a precise superhuman system and the unique architecture of the garden, which was later neglected and destroyed in the new urban development [49]. Second, the vernacular architectural patterns of this region have not yet been studied in detail. Third, the rate at which people are abandoning

their vernacular houses has increased significantly over the last ten years. Fourth, the new building trend in the region has led to socio-cultural and environmental problems.

Figure 2. This picture shows the style of the new trend architecture (right) and the vernacular architecture (left) in the Salami region (image source: author).

Although ten vernacular houses were studied during the fieldwork of this study, three representative vernacular houses in the area were selected as the main case studies for this study due to their location (characteristic of the neighborhood), their proximity to the historical sites of the area (Salami Palace and the main square), and the occupation of the owners (Figure 4).



(**a**)

(**b**)

Figure 3. These two images show that the rapid development in this region has dramatically influenced the planning of the area at different levels: (**a**) aerial view of Salami in 1968 (image source: Available at the Palace of Salami, edited by the author); (**b**) aerial view of Salami in 2023 (source of image: Google Earth, 2023).

Figure 4. Location of the three representatives' case studies in Salami city in the case study region: two of them are in the first district of the area (near the historical palace and the main square), the historic center of the area (built in 1951). They were chosen because the vernacular atmosphere of the dwellings has been preserved. The third building is in the second district, where most of the houses are still vernacular due to the settlement. No case studies were selected from the third district because most of the houses in this area were built in the new trend building style (image source: author).

5. Socio-Cultural Influences on Vernacular Architecture

The vernacular socio-cultural aspects of the people in the case study area are mainly based on the people's religious issues, *Islam*. This has given essential meaning to most of

their activities. For example, one of the crucial socio-cultural aspects is the observance of 'privacy' as a religious precept is an expression of local beliefs and traditions that determine life and, thus, vernacular architecture in various ways. Firstly, the issue of privacy led to vernacular buildings being designed without external openings and with high walls to prevent anyone from looking inside (Figure 5).

Figure 5. This image shows the vernacular houses in the case study region that are designed with high exterior walls without openings to the outside to prevent people from looking in (Source of Image: author).

Secondly, the issue of privacy has led to the division of the interior spaces of vernacular buildings into three types of spaces (open, closed and semi-open spaces) that 'control' the activities of private and non-private individuals. The access pattern plays an essential role in creating privacy within the spaces. It is regulated by semi-open spaces (porches) that separate open and closed spaces so that family members, especially women, can go to other spaces undisturbed (Figure 6).

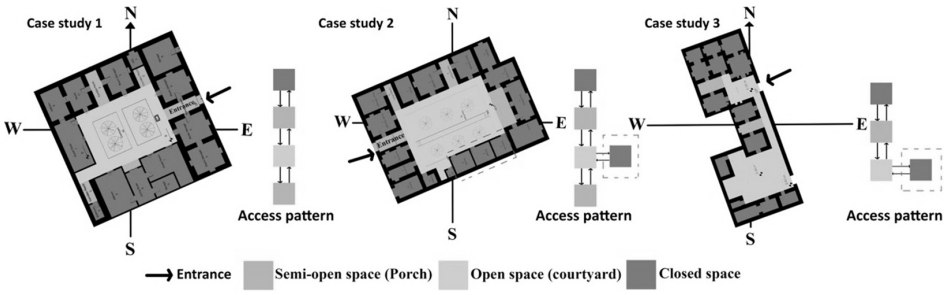


Figure 6. This image shows the access patterns of the three case studies (image source: author).

Another important socio-cultural aspect is the 'kinship system' of the region, which influenced vernacular architecture due to the importance of family relationships in local culture and tradition. In their society, it was traditional for parents to host the next generations in their house, which led to the creation of additional rooms around the courtyard or adapted to other houses in the neighborhood with which they had been connected for years (Figure 7).

Another crucial socio-cultural aspect is the 'structure of the settlement', which is determined by different traditions and social systems, meaning that the sites are inextricably linked to outdoor components such as alleys and passageways. For example, children usually play in the street, and most social gatherings, with the exception of family gatherings, take place in the street. Therefore, one or two chairs (called *pirneshin* by the locals) are

placed near the entrance of most vernacular houses to provide a place to rest and meet with other people (Figure 8).

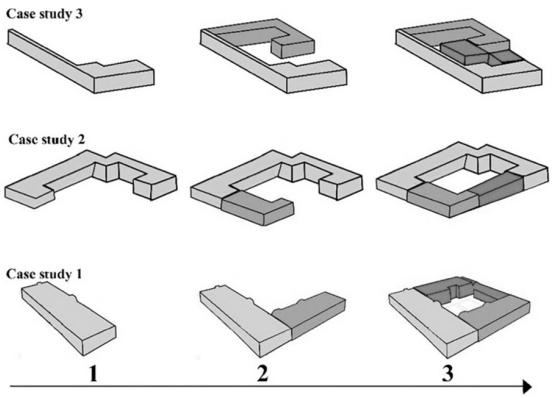


Figure 7. Over the years, rooms were added to the parents' rooms (Number 1) to accommodate the new generations (image source: author).

(**a**)

(**b**)

Figure 8. These images show some activities in outdoor areas, such as alleys and passageways: (**a**) children playing in the street; (**b**) chairs were placed near the entrance of each house to create a place to rest and meet with other people and to connect the house with the urban components (image source: author).

Another important socio-cultural aspect is the importance of 'hospitality' for the people, which is part of their traditions and culture. It has also affected the vernacular architecture of the region by decorating the entrances of the vernacular houses with various trees. This deliberate choice serves the dual purpose of esthetic embellishment and practical functionality, as these trees provide vital shade in the region's hot climate, as shown in Figure 9. This thoughtful integration not only enhances the visual appeal of the homes but also symbolizes a warm welcome and embodies the cultural importance placed on hospitality. The symbiotic relationship between the architectural and natural elements emphasizes the depth of cultural values and practical considerations that have gone into the design of these vernacular homes.

Figure 9. The decorated entrances of vernacular houses bear witness to a cultural tradition in which various trees not only have an aesthetic appeal but also provide a warm welcome by providing the necessary shade in the hot climate of the case study region (image source: author).

In addition to the socio-cultural aspects mentioned above, some 'religious definitions and descriptions' of the people, *Islam*, have also influenced and given meaning to some parts of the exterior and interior of the vernacular houses. For example, paradise is defined in the religious book (*Quran*) as a place full of rivers and trees, and the design of the people's houses is influenced by this, such as various trees in the courtyards and the decoration of the houses with flowers (Figure 10).

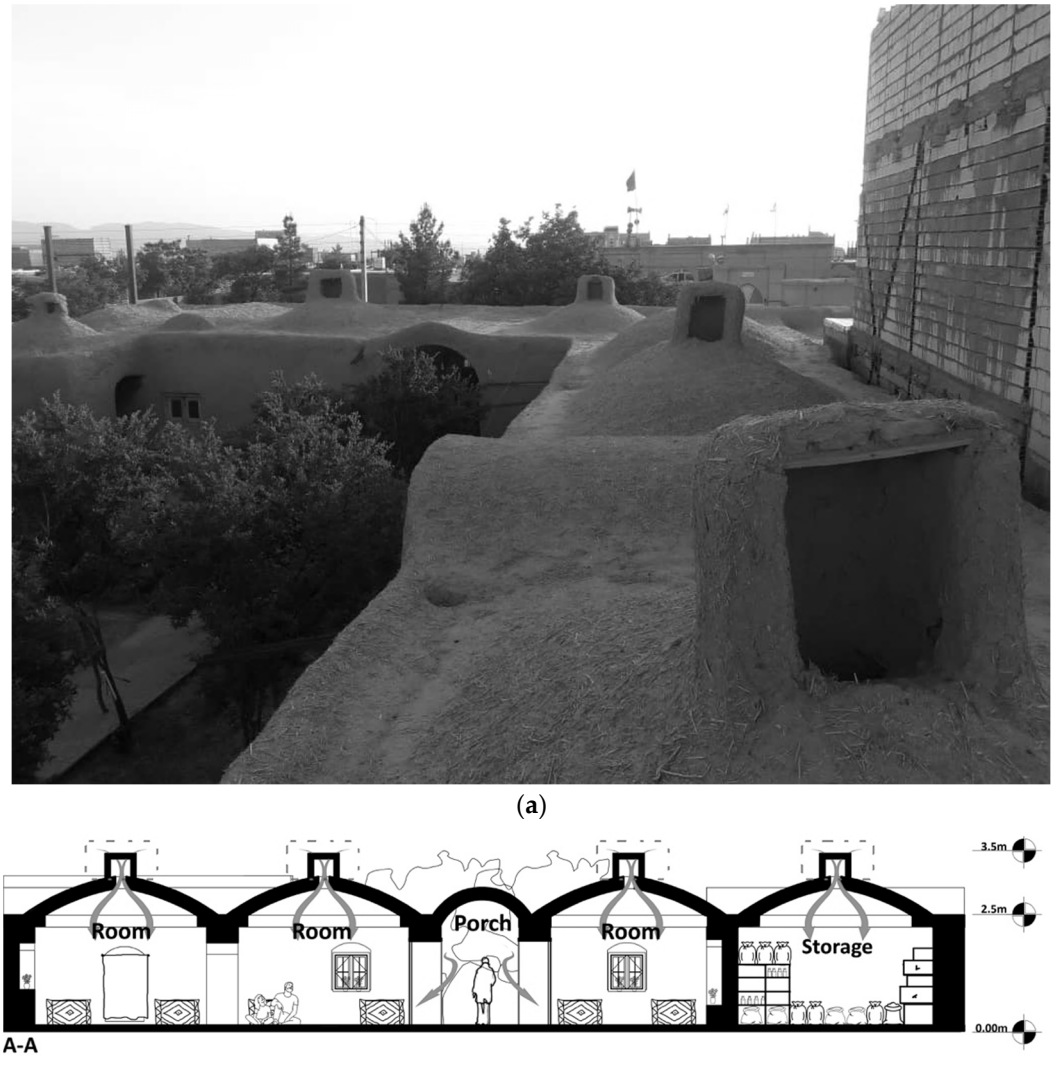
Figure 10. This picture shows the use of trees for the courtyard (image source: author).

6. Environmental Influences on Vernacular Architecture

The case study area is 1060 m above sea level, and the climate of the region is categorized as arid, with hot and dry summers and cold and semi-dry winters with De Martonnie calcification [50]. The area is under the influence of the region's north-easterly winds, referred to by locals as the 'straight summer winds' or '120-day winds'. The only material available in the region is clay, which is the only material used in the construction of vernacular architecture. The people in the case study region could cope with the environmental conditions of the region and create a comfortable living environment through various strategies and skills. For example, to keep the inside of their house cold during the day and warm at night, they built their vernacular houses with thick mud walls (approximately 80 cm), which serve as insulation (Figure 11).

Figure 11. Vernacular houses are equipped with 80 cm thick clay walls, which serve as insulation to keep the interior temperature cold during the day and warm at night (image source: author).

Another environmental strategy of vernacular buildings to meet the environmental conditions of the region is the use of domed roofs for each room, as this creates a larger surface area that has more contact with the open air than a flat roof, causing the temperature to drop faster and the roof surface to receive more shade from the sun's rays. The domed roofs are also fitted with wind catchers (facing north, the prevailing wind direction), called *badgir* by the locals, to direct the wind into the rooms, which has two benefits for the locals: creating a pleasant living climate and relieving pressure on the storage rooms for agricultural produce (Figure 12).



(**a**)

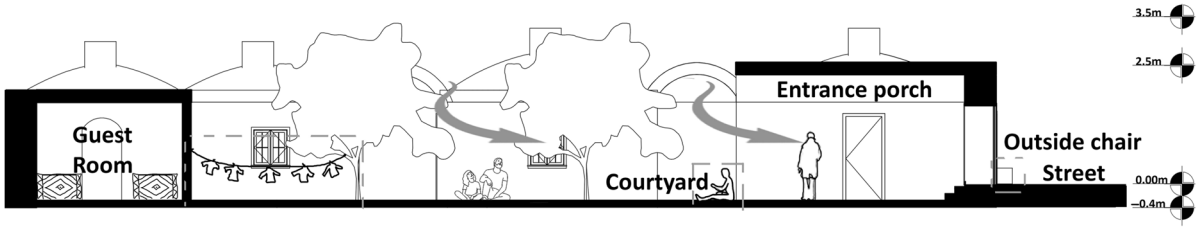
(**b**)

Figure 12. These pictures show the windcatchers of the vernacular houses: (**a**) domed roofs that are also equipped with windcatchers; (**b**) a section from one of the case studies showing the use of wind catchers for rooms and storerooms (image source: author).

Another environmental strategy used by the people in vernacular buildings to adapt them to the environmental conditions of the region is the use of an interior courtyard (open space) in their houses, which allows the wind to circulate inside and enter the rooms through windows and porches (semi-open spaces). The porches also serve as a pleasant place to stay to avoid direct sunlight and enjoy the wind from the courtyard. In addition, the placement of various trees indoors prevents direct sunlight and creates a comfortable area where residents can carry out some of their activities, such as meeting during the day and hanging out their laundry (Figure 13).

(**a**)

(**b**)



(**c**)

Figure 13. These images show the use of courtyards and porches in the vernacular architecture of the area: (**a**) the courtyard of one of the vernacular houses, planted with various trees to avoid direct sunlight; (**b**) a porch (semi-open spaces) in the vernacular house, which not only connects different rooms but also serves as a comfortable lounge area for the residents to avoid direct sunlight; (**c**) a section from one of the case studies showing the utilization of the circulating wind in the courtyard and some of the activities of the residents of the courtyard (image source: author).

Another environmental strategy used by people in vernacular buildings to adapt them to the environmental conditions of the region is the organization of interior spaces (closed, open, semi-open spaces). For example, the main part of the Indigenous people's living area is mainly located on the north side of the property to receive more favorable light from the south in this region. The enclosed spaces are tightly designed to ensure sufficient heat exchange between the rooms. In addition, semi-open areas (porches) were created between

the main entrances to provide shade, allow the wind to circulate in the rooms and create an area for settlements (Figure 14).

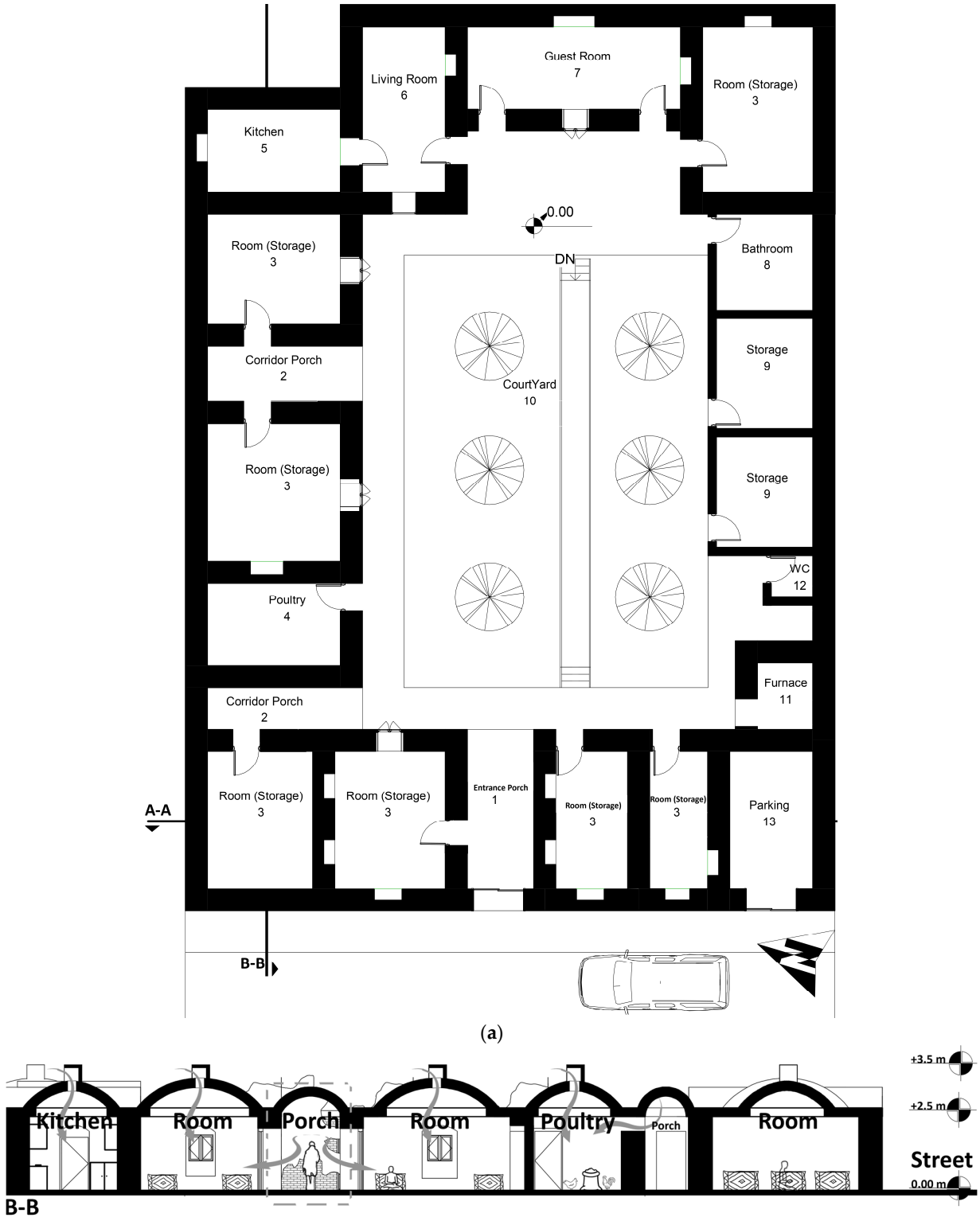


Figure 14. These pictures show the space organization of the vernacular houses in the area: (**a**) floor plan of one of the vernacular houses with the division of the interior rooms (closed, open and semi-open spaces); (**b**) section from a case study showing the circulation of the wind with porches and the densely designed enclosed spaces (image source: author).

Another environmental strategy that people use in vernacular buildings to adapt them to the environmental conditions of the region is the way they control the opening of closed spaces. They provide their interior doors with a carpet instead of a door to control the wind circulation in the rooms from the semi-open spaces (porches), which are also transparent to let the light into the room when they block the wind (Figure 15).

Figure 15. The picture shows the way they control the opening of enclosed spaces by fitting their interior doors with a carpet instead of a door to control the wind circulation (image source: author).

7. Construction Progress of Vernacular Architecture in the Case Study Area

The construction progress of the vernacular buildings in the case study area is generally divided into three main phases, considering the three factors (environmental conditions of the area, socio-cultural aspects and professional activities of the people) that describe different points of their knowledge. These three phases are carried out through the cooperation and teamwork of the experienced vernacular house builders (part of the locals) and the locals (family members and neighbors) of different ages, which also allows the younger generation of the area to learn from the previous generations. One of the owners of a vernacular house in the area (a male farmer, 78 years old) commented:

> "*The first part of my house was built with the help of an expert in vernacular houses in the village, my neighbours, my friends, and my family. This collaboration led us to share our experiences to create a more efficient space for my vernacular house. The other parts of my house were built over the years by me, my family, and my friends to fulfil my new needs of that time, such as to accommodate my children and to create space for my farm produce or my animals.*"

From the conversations with the locals, it is clear that in the first phase of the construction of the vernacular houses, the locals took into account the environmental conditions of the area. Firstly, they chose the best orientation by building the living area on the north side of the site to maximize the south light. Secondly, the stability of the vernacular building was ensured by using the only material available in the area, clay. Therefore, thick adobe walls (about 80 cm) with a vaulted roof are used, allowing the construction of stable and

larger rooms. They then consider how to organize the spaces (open, closed and semi-open spaces) according to their needs to create an efficient living environment for themselves and their family.

The second phase of the building progress concerns the socio-cultural aspects of the people in the area, such as the influences of privacy and kinship, the connection of vernacular houses with the outside world, hospitality and the influences of religious meanings (see the previous part of this article for more information). The success of the building progress is achieved when the vernacular architecture of the region reflects a mixture of the first and second steps (environmental and socio-cultural influences). For example, the socio-cultural importance of people's privacy has co-operated with other architectural patterns (such as the patterns of environmental sustainability). In other words, the socio-cultural importance of family privacy affects vernacular buildings, resulting, for example, in limited openings to the outside and the division of spaces by semi-open spaces (porches), as well as the use of high exterior walls to protect family privacy. But they are also linked to other vernacular patterns and have other functions, such as the environmental sustainability patterns of vernacular buildings, as the limited openings to the outside prevent heat exchange, the porches also serve as a ventilation system and high exterior walls create larger shadows inside the vernacular houses.

The final construction phase is about creating spaces that suit the occupations of the residents. Since most of the older adults in the area (most of the people who now live in vernacular houses) are engaged in livestock rearing and farming, spaces for their farm produce and animals are essential. One of the respondents said, 'The storage spaces in my vernacular house are the most important parts of my house.' The part of the property furthest away from the living area (mainly the southern part) is designated for these rooms. These rooms are usually equipped with wind catchers and have no windows to increase the durability of the products. However, the third part is specific to the owner's occupations, is changeable and plays an essential role in their daily activities. The three phases complement each other in defining the construction progress of vernacular architecture in the region, and many of their factors overlap.

8. Transition from Vernacular Architecture

In this study, it is found that the vernacular architecture of the case study area provided an appropriate living environment for people, particularly for the older generations. According to two interviewees in the case study area, who are still living in a vernacular house:

First interviewee (a male farmer, 70 years old):

> "*I feel comfortable in my vernacular house and can feel my identity in it. I am able to adapt my vernacular house to my new needs, for example by creating more space (around the courtyard) for my agricultural products (Figure 16), which I think is not possible in the new building trend.*"

Second interviewee (a male shepherd and farmer, 75 years old):

> "*I cannot change my vernacular house because my livelihood and life are integrated with it. I built this house with my own hands and every part of it gives me a sense of belonging and identity. I think young people believe that the new building trend is in better condition and makes them seem more affluent, which I do not believe.*"

The site visit revealed that most older people in the case study area have not replaced their houses with the new building trend and prefer to stay in their vernacular houses. There are two main reasons for this. Firstly, they built their vernacular houses with their own hands and with the involvement of their families and friends, which gave them a sense of belonging and identity. Secondly, they were able to adapt their vernacular houses to their new needs, which they have done over the years. In other words, the vernacular architectural patterns were adapted (not completely changed) by the locals to meet the new requirements.

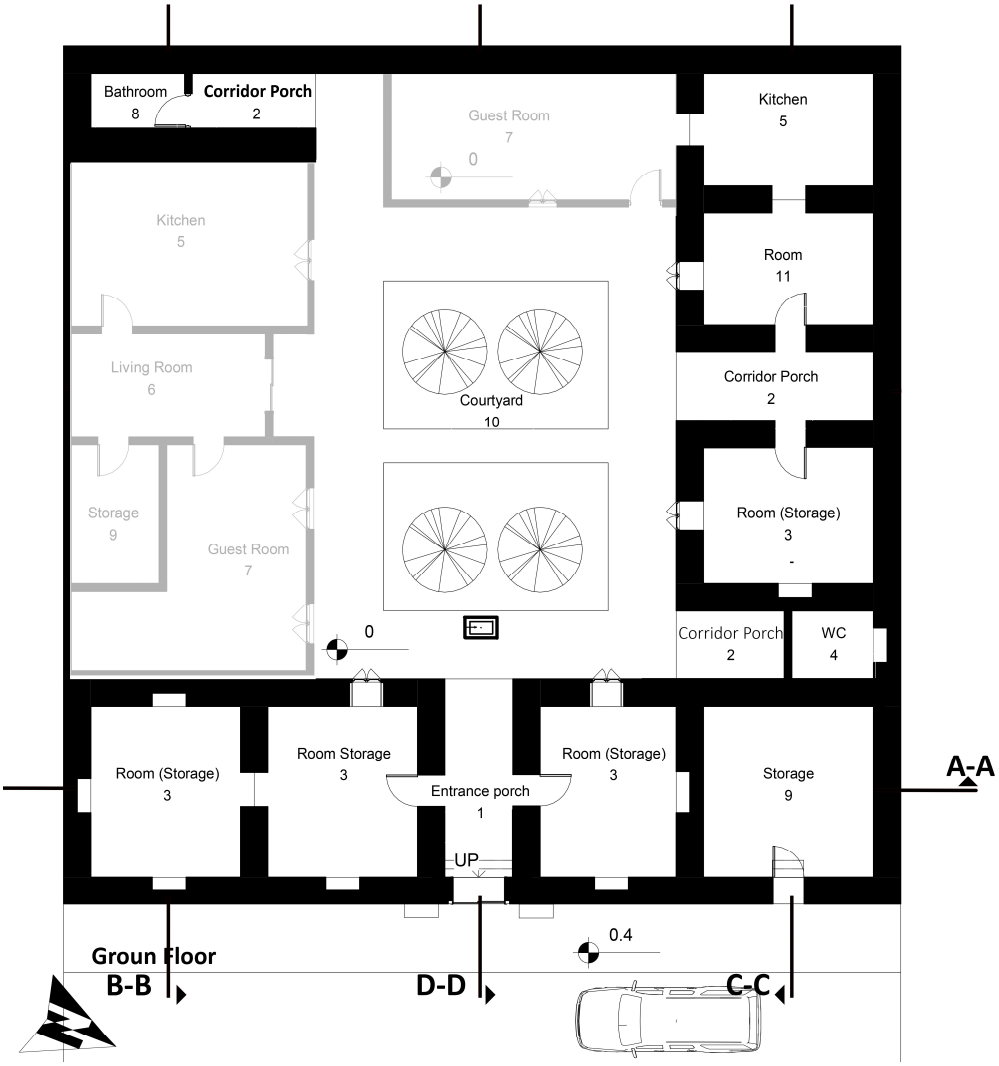


Figure 16. The image shows the rooms around the courtyard (grey color) that were added by the inhabitants over the decades due to their new needs. It should also be noted that the function of some rooms has changed over time. The function of the rooms in the picture was indicated during the visit to the house (image source: author).

On the other hand, most of the younger generations in the case study area refuse to live in the vernacular houses of the area. Two of the interviewees, who have replaced their vernacular houses with a new building trend houses in the area, stated the following:

First interviewee (a 28-year-old man who works in a cement factory):

"The most obvious factor I would cite is that the new trendy houses in the area are fashionable and show more affluent people. And as I know most of my single friends are also waiting to buy a new trendy house to get married. The second reason is that land prices have increased recently, which has led to multi-storey houses being considered more (Figure 17). Another reason, in my opinion, could be that the living conditions of people in the area have changed, especially for the new generation as many factories have settled in the city to employ them. This eliminates the need for storage rooms that used to be common in the area."

Second interviewee (a 30-year-old man who works in an ironstone factory):

"This kind of house (the new building trend) is now fashionable in the area, and you do not find young people who still want to live in vernacular houses. And I think if someone lives in a vernacular house, they cannot afford to move. Besides, these houses are economically

advantageous. If the principles of the area allow you to build multi-storey buildings, it's better to build more houses and share the price of the land with other people. I also think that some parts of vernacular houses are no longer useful as technology has taken over. My mum, for example, used the courtyard for various activities such as washing and hanging laundry, which I can now do with a washing machine in a small space."

Figure 17. The picture shows the new building trend (multi-storey) in the case study area that was built in 2020 (image source: author).

It is obvious that the younger generations in the region reject living in vernacular houses for two reasons: First, financial advantages lead them to build their houses vertically (with multiple floors) rather than horizontally (with extra rooms around the courtyard) due to the increase in land prices in the region. Secondly, the lifestyle of younger generations in the region has changed due to three main factors: changes in the occupations of younger generations, technological devices and the idea of being more fashionable and living the way people in cities are portrayed. These three factors have made some features of vernacular houses in the countryside less suited to the new lifestyle of the younger generations.

However, the younger generations of the case study area also claimed that the new trendy buildings of the area do not fit the identity of the neighborhood and cause them some environmental and social problems. One of the interviewees (a 30-year-old man who works in a factory near the city and has replaced his vernacular house with a new trendy house in the neighborhood) commented:

"... But to be honest, the bills have become more expensive and without electrical appliances it is impossible to live in, which was not the case in the vernacular houses. I think the spirit of the neighbourhood has been lost in these houses. The connection between my house and the surrounding area and the neighbourhood has also been lost."

The lifestyle of the younger generations is, therefore, primarily characterized by the influence of the modern world. Various factors such as the rapid development in the

area surrounding the case study area, technological progress and the promotion of urban lifestyles have significantly influenced the change from vernacular architecture to the new building trend, even if this has led to social and environmental problems. Therefore, the reinterpretation of vernacular architectural patterns in today's rural architecture must consider the new concerns of the younger generation that have caused the transition from vernacular architecture.

9. Architectural Patterns Evolution: Exploring Architectural 'Sub-Patterns'

In this study, we examined firstly the vernacular lifestyle of the people and its relationship to vernacular architectural patterns and, secondly, the reasons for the abandonment of vernacular architecture in order to bridge the gap between the vernacular tradition and current architecture in rural Iran. Vernacular architecture in the case study area was investigated not only in terms of its environmental sustainability patterns but also as a system encompassing all vernacular life patterns of people and their interaction with the built environment under two main aspects, namely during construction and use, underpinned by its socio-cultural aspects and the environmental conditions of the region. Our results reveal several important findings. Firstly, we found that all vernacular architectural patterns (the socio-cultural patterns and the patterns of environmental sustainability) in the case study area in Iran are interconnected as a system and play their role at different levels, as has been mentioned by other researchers for other geographical parts of the world (e.g., [24,37,39]). However, this is in contrast to most previous methods of learning from vernacular architecture in Iran by looking at only one of its features, such as its patterns and strategies of environmental sustainability (e.g., [21,51]), without considering the other patterns and contexts that have shaped it when it comes to transferring the findings to the larger practice for the locals.

Secondly, it was found that the older generations in the case study area were able to 'adapt' their vernacular architectural patterns over the decades due to some socio-cultural changes and that they still prefer to live in their vernacular houses and not switch to new trendy architecture. In contrast, the younger generations of the case study area, although they know that the new trendy houses do not fit into their neighborhood and cause them some environmental and socio-cultural problems, prefer to move into the new trendy houses as they believe that the vernacular houses in the area cannot be adapted to their new needs. The reasons for this are the financial benefits of the new trendy houses and the change in their lifestyle compared to the older generations due to the rapid industrial development in the region, technological advancement and the promotion of urban lifestyle by accelerating the connection between urban and rural areas. Thus, from this research finding, it could be concluded that, unlike previous studies that only examined one or a few vernacular architectural patterns that emerged from the experience of one part of society, the older generations, to bridge the gap between vernacular tradition and contemporary architecture, this research emphasizes another factor that should also be considered, namely the needs of the other parts of society, especially the younger generations, who are more willing to abandon vernacular architecture.

It should be recognized that people's needs change according to the situation (technology, environment, socio-cultural changes, etc.). So, if the patterns are stable [37] (p. 158), how can they be adapted to different changes? If we take a closer look at the vernacular architecture of the case study area, for example, it becomes clear that the locals (especially the older generation) were able to update (rather than completely change) their vernacular architectural patterns to respond to the new socio-cultural conditions that emerged over the decades. In other words, when the structure of the main socio-cultural patterns was updated through some changes, labeled 'socio-cultural sub-patterns' in this study, some updates were also incorporated into the structure of the main architectural patterns, labeled 'architectural sub-patterns' in this study, in response. It can be concluded that when socio-cultural changes occur, the architectural patterns should be updated to maintain the previous linkage between them.

The connection between sub-patterns and main patterns is different from the connection between the two main patterns. They adapt their internal structure and strengthen the network connection when the adaptation process spends its appropriate time creating the right architectural sub-patterns to support (respond to) the new socio-cultural sub-pattern (Figure 18). The adaptation process of architectural patterns over the decades is a phenomenon that has not yet been brought into focus. It could be the next consideration in the study of vernacular architecture. Investigate how architectural sub-patterns have worked together with unknown socio-cultural sub-patterns in recent decades to harmonies the main patterns. This would allow us to recognize redevelopment progress and anticipate the development of vernacular architecture for today and the future.

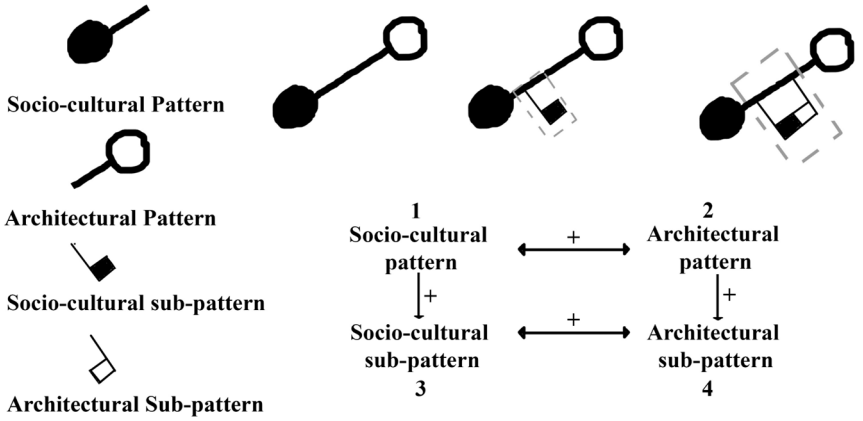


Figure 18. This picture shows the changes in the socio-cultural conditions of the area lead to socio-cultural sub-patterns in the whole socio-cultural patterns, and then architectural sub-patterns should be designed to maintain the connection between the two main patterns (socio-cultural patterns and architectural patterns) (image source: author).

On the other hand, if the architectural sub-patterns are not designed to respond to the socio-cultural sub-patterns in time, the main socio-cultural patterns and the architectural patterns will be decoupled, which is the main cause of the problems that occur in the case study area (Figure 19), and then lead to a disconnection from the larger levels of the main patterns. In most cases, sudden changes in the socio-cultural situation are the cause of this phenomenon, as there is no time for adaptation. For example, due to the rapid industrialization in the case study area, the socio-cultural sub-patterns (new mental and physical demands) are considered separately and responded to with different methods, leading to a disconnection between the main vernacular architectural and socio-cultural patterns.

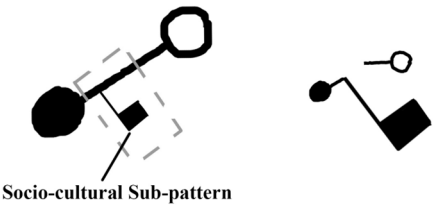


Figure 19. The picture shows that the socio-cultural sub-patterns led to a decoupling between the main architectural pattern and the socio-cultural pattern, as the architectural sub-patterns did not have enough time to adapt (image source: author).

10. Conclusions

The results show that the inhabitants of the case study area, especially the older generations, were able to manage the efficiency of the spaces in their vernacular architecture according to their needs, considering various aspects (such as the socio-cultural aspects and the environmental conditions of the region) to create a comfortable living environment for themselves and their family. The findings have shed light on vernacular architecture in Iran

as a system by showing the inseparable links between the different vernacular architectural patterns. The findings thus contradict the previous methods of learning from vernacular architecture in Iran by looking at only one of its characteristics, such as its environmental sustainability patterns and strategies, without considering the other patterns and contexts that have shaped it.

On the other hand, the findings show how the speed of modernization in the region has significantly affected the lifestyle of the people, especially the younger generations, by imposing on them some new demands that could not be met by the vernacular architecture of the region, prompting them to turn to the new building trend. Therefore, in order to draw lessons from vernacular architectural patterns for current architecture in rural Iran, it is necessary to limit their communication concerning the contemporary needs of the people but not completely neglect this communication by looking at only one vernacular architectural pattern to learn from it. It should be noted that the results show that some vernacular architectural patterns are not adaptable, and some of them are not suitable for current architecture and demands. So, to find a way to reinterpret suitable vernacular architectural patterns in current architecture, this study has opened a new discourse in the theory of a pattern language by considering 'architectural sub-patterns' as a concern for future studies. Vellinga has also emphasized that it is important to find an approach to project the future of vernacular architecture: 'It is necessary to look both forwards, as well as back' [29] (p. 22).

At this point, therefore, it is important to look back and consider the key factors in the success and failure of vernacular architecture over time. In the case study of this research, it was found that the success of vernacular architecture in creating a comfortable living environment lies in the utilization of vernacular knowledge through participation and sharing of experiences during the construction progress of the vernacular houses. The fault lies in the fact that the needs of society suddenly change, and vernacular knowledge cannot respond in time, such as the lack of technical knowledge to equip vernacular houses with technical devices. This shows how important it is for academic architects to capitalize on the success of vernacular knowledge and help them with their academic knowledge, especially now that the transition from vernacular architectural patterns cannot be avoided. In other words, cooperation between academic architects and local people is now crucial for the reinterpretation of vernacular architectural patterns in the transition period. Today's vernacular architecture, which takes into account vernacular patterns and the contemporary needs of society, could therefore be described as "architecture with and without architects".

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