

Original Research Article

The Role of Geography in the Process of the Formation of Open Spaces in Mazandaran Rural Houses*

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Abstract Over time, the shape of houses and living patterns are changing. This development is inevitable both in the city and in the countryside. Assuming that the style and quality of rural life depends on the pattern of houses and geography can play a significant role in the formation of rural housing, The review of this research is important. This research aims to analyze the role of geography and environment in the process of forming open spaces and areas in rural houses in Mazandaran province. The main question of this research is what role geography plays in the process of forming open spaces in rural houses in Mazandaran. Considering that open spaces and areas have played a very important role in the activities and livelihoods of residents in the past, are the structure and function of areas affected by geographical zoning? This research was conducted using a qualitative, applied, descriptive, and analytical method, and the data collection was documentary with field observations. This study examined rural housing in three geographical areas: plains, foothills, and mountains to understand the context for formation of local architecture and identify cause-and-effect relationships. While analyzing the available statistical data, samples from all three areas were examined, and finally, for the reliability of the results, field discussions and qualitative interviews were also conducted with residents. The findings of the study indicate that the geographical environment has a very influential role in the open spaces of rural settlements. Basic studies show that the areas in mountainous and foothill areas are relatively small, while in plain villages they have significant dimensions. The results of observations and discussions confirm that over time, changes in the lifestyle of villagers have led to physical changes in houses, and not only the environment but also economic, social, and cultural factors have played a role in the formation of spatial relations in rural housing. In this study, the concept of spatial relations focuses on the interaction of open spaces with the residential sector in rural housing.

Keywords *Rural houses, Environment and geography, Mazandaran villages, Open spaces, Spatial relations.*

Introduction The location of a settlement reflects its natural and functional location. The natural location is directly related to natural environmental factors, such as elevation, water resources, and vegetation. Accordingly, it reflects many characteristics of the village, including

population size, type of activity, access to resources, and potential for growth and development. The gradual elimination of the values of indigenous rural housing is a fact that this type of housing, in its period, has many values in terms of how it interacts with environmental conditions (both natural and human geography), the use of methods, techniques, and materials that are compatible with local resources, compatibility with the way villagers live, and many other things. Some of them can be easily exploited in their current form and

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some changes might improve and upgrade them. Thus, despite the fact that the transformation of indigenous rural housing is an undeniable necessity due to the challenges it faces; However, the sustainable material and spiritual values inherent in it confirm the necessity of recognizing and utilizing them in alternative forms. Therefore, the main goal of this research can be considered to provide a comprehensive and systematic understanding of the impact of geography on rural housing in Mazandaran province. This comprehensive understanding should be able to provide a suitable and scientific basis for activities that will be carried out in the field of improvement, reconstruction, and renovation of rural housing in this province.

Research Background

Rural housing is one of the topics that different researchers have addressed based on different approaches, and four study groups have been examined in accordance with the present study. The first group is typology studies and analysis of the architecture and texture of the village, some of which include: typologies of rural housing conducted by the Islamic Revolution Housing Foundation, such as the typology of rural housing in Mazandaran province (Raheb & Torkashvand, 2012), which has addressed the understanding of rural architecture and presented proposed designs. The second group is sources that examine the village from the perspective of materials and construction. In the book "An Introduction to Understanding Iranian Rural Architecture", Zargar examined examples and examples of Iranian rural architecture in terms of materials and construction methods by stating the factors affecting the formation of the structure of villages (Zargar, 1999). Some sources have analyzed the village from the perspective of climate and geographical zoning. In the book "Climatic Survey of Traditional Iranian Buildings", (Ghobadian, 2005). examined the characteristics of the urban and rural settlements of this region by stating the characteristics of the climate of the Caspian region, in terms of axes such as building form, type of materials, etc. Sartipipour evaluated and analyzed rural housing indicators, elements, quantities, and spatial qualities, as well as differences in different geographical zones in a series of articles he has compiled in different years. In an article titled "Spatial Quality in the Design of Small Settlements: Rural Texture", he attempted to show the neglected role of "space" and its "quality" in shaping the rural texture, based on the experiences he has had (Sartipipour & Sartipipour, 2019). Another streams of studies have scrutinized the village from the perspective

of lifestyle, socio-cultural characteristics, and tourism development, such as the article "The Relationship Between Inside and Outside the House in the Narrative of Female Residents; Case Study: Middle Texture Houses of Kermanshah City" which deals with the spatial relationships of rural housing (Bakhtiarimanesh et al., 2024). The present article, while addressing local architectural patterns, also examines the factors affecting the process of forming the spatial structure of these dwellings and the role of the environment in the formation of open spaces in the body of rural buildings.

Research Method

This article has an applied objective and is qualitative in nature. The research method is descriptive-analytical, with data collection in the form of libraries and a significant amount of research in the field. Initially, recognition and classification based on geographical zoning were addressed, and the characteristics of rural housing in three zones of plains, foothills, and mountains were examined. Based on the geographical divisions of 12 introduced rural housing, while observing and analyzing open spaces and areas in different types of rural housing, qualitative discussions and interviews were also conducted with residents. In addition to the aforementioned, based on the statistical data of 2018 on the characteristics of rural housing in the province, the effective information was analyzed in the form of a pie chart. Finally, based on the research findings, the factors affecting the formation of open spaces in rural houses in this zone are analyzed.

Theoretical Foundations

• Residence and sense of place in the village

Housing, as a manifestation of the concept of human habitation in an environment, has always been influenced by historical conditions and the goals and policies that occurred in the growth or decline of the situation in which it was formed. The house can be considered as a physical mechanism, a mechanism that reflects the worldview and morality of a people and also helps to create them, and in this respect it is comparable to various social institutions - or mechanisms - that play the same role (Rappaport, 2009). Security and well-being are also two qualitative concepts that we expect to be realized in the house. "The house is still associated with the known values that give us security" (Norberg-Shulz, 2002). The sense of security and well-being are secondary human needs that, although they are not equivalent to primary needs in appearance, their deprivation disrupts the continuation of life. Also, the

house is the physical embodiment of the family's critical space. According to Edward Hall's research on the realm of living beings, "All animals need a minimum space without which survival is impossible. This space is the critical space (territory) of that living being." (Hall, 1966, 16) According to the definition of housing by the three above theorists, the manifestation of the concept of residence depends on security, so the house is a safe place. Next, the sense of place in the house is examined. A sense of place explains a kind of relationship between humans and place, and it is understood as a deep emotional and sensory bond that is created between the individual and the place. By creating this bond, the biophysical environment for the individual becomes a place with distinctive characteristics and features that are intertwined with the individual's existence and identity. The result of this feeling for people is the creation of security, comfort, and comfort of living in the place and becoming familiar with the place and the motivation to stay and live in it (Ardoin, 2006, 119). The life of villages throughout history has always been shaped in interaction with the life of cities. Various reasons have been given for the creation of cities and the migration of rural people to cities throughout history, and the most common reason for the emergence of cities is related to the economy, meaning that the surplus production of agricultural products made some people unnecessary from cultivating and producing crops, which in turn facilitated the collection of surplus food for an urban population (Shieh, 1996). When observing and studying rural housing, it seems simple and primitive, but these buildings were built by people whose members are connected to the whole group through all the factors and institutions of social life and therefore have unlimited knowledge and recognition that they receive from other members. In such societies, each active member of the group can build his own house or have serious participation in its construction (Zargar, 2009). Rural housing, as an output of the essential human need for shelter, shows its shape and form as a result of human actions in nature and affects different aspects of the residents' lives with its type of architecture and diverse functional spaces (Ghadiri Masoum et al., 2021).

The quality of rural life reflects the efforts and satisfaction of people to improve their living conditions, sense of security, and well-being, but researchers have stated that a good quality of life in rural areas develops when governments can bring effective economic, social, and environmental processes to the village level and make the living conditions for rural residents equal to those of urban communities (Futa & Ewuola, 2010).

The space of a rural home is a space consisting of the comprehensive presence of a rural person in the place he has chosen to live, this presence encompasses all aspects of his material and spiritual individual and social life (Alalhesabi, 1993). According to the materials presented in this section, which first defined housing, sense of place, rural life in interaction with the city and finally discussed the quality of rural life, and with a general look at native settlements in different regions, it can be seen that the composition of two open and closed spaces follows a specific system and the organization of these spaces is affected by various factors that exist in the context of these works. A major part of the continuity and cohesion seen in a native settlement is due to the system of two open and closed spaces in native architecture. Open and closed spaces in native architecture are so interconnected that each determines the form of the other. In general, the combination of open and closed spaces is formed under the influence of numerous factors such as climatic, environmental, cultural and social, livelihood and aesthetic factors, etc., and depending on the spatial and temporal location and function of the building, the influence of some factors has been more pronounced or less pronounced than others.

• Lifestyle

Since people living in rural areas have a creative and socially dynamic nature, this feature should be taken into account in research conducted in this environment and a single method and prescription should be avoided in solving rural problems (Afsharipour et al., 2021). When the social world changes, we need new concepts to understand it. The application of the concept of lifestyle has changed in accordance with cultural and social developments. Until the Second World War, the concept of lifestyle was not very important and was not generally mentioned by this name. After the Second World War, with the expansion of social foundations and the creation of the practical possibility of mass production and consumption of goods, especially cultural goods, lifestyles became very diverse. Also, economic growth, the mechanization of work, rising wages, and the expansion of entertainment and leisure facilities created a society in the industrial West in which traditional distinctions were somewhat erased, meaning that each individual and social group could distinguish itself from others only through the diversity it exhibited in its choice of occupation, place of residence, its grooming and clothing, its artistic and aesthetic tastes, its choice of hobbies and how it spent its free time, and even its practical, moral, and religious practices. Megacities made people anonymous

in the city, and therefore it became impossible to identify individuals based on past status indicators, and there was evidence that people no longer thought and behaved based on their position in the production system (Fazeli, 2003, 62). It was from this time that the concept of lifestyle was introduced in its new meaning. People living in modern societies use the concept of lifestyle to describe their actions and those of others. Lifestyles are patterns of action that distinguish people from each other, so lifestyles help us understand what people do and why, and the meaning they have for them and others (Chaney, 1996). Analysts should not only consider the context of changes in diet, leisure habits, or expectations. It is not enough to know the cultural meanings of gender roles but also to know the cultural meanings of various kinds of change. Lifestyles are also forms of collective identity that evolve over time. In classical sociological theories, this concept has been used mainly to distinguish between social classes or social groups. The mid-nineteenth-century world that Marx set out to analyze was so involved in the process of production, and so organized around the values and processes associated with it, that the concept of "social class" - as a concept that made it possible to analyze the position of people in the capitalist system - found a dominant position in Marxist analysis of the emerging society. Now that it seems that "... the most important development that has occurred in the last century has been the expansion of historical consumption" (Bocock, 2002, 120), we need new concepts for analyzing society. Such a concept or concepts need to reflect the development that has occurred and also put forward a new research program for the social sciences. The concept of "lifestyle" has such characteristics. In a simple and general definition, lifestyle can be defined as a "way of life" or, more precisely, as the patterns and methods of "everyday life". Lifestyle is a part of life that is practically being realized and includes the full range of activities that individuals carry out in their daily lives, as well as Characteristics such as having a style (distinctive, special form, outstanding quality, place, or person) apply to them. The range of activities of individuals in each field can be the builder of their lifestyle in that field. For this reason, we can talk about lifestyle in the field of material consumption, health behavior, cultural consumption, or behavior in the home (Razavizadeh, 2004, 28). Considering the aforementioned principles, the concept of lifestyle changes in accordance with social and cultural developments. Economic conditions are also effective factors. Therefore, lifestyle is not limited to the home and can be focused on and influenced by attitudes, values, location, and social class.

• Physical geography

The important and effective factors in the formation of various architectural spaces can be broadly classified into two groups: first, material and environmental factors; and second, cultural and historical factors (Soltanzadeh, 2011). Each environment has unique characteristics that distinguish it from other environments, thus one of the main characteristics of the geographical environment is the existence of a distinction (Varmaghani et al., 2015). The study of housing, by considering its dependencies and connections in the form of a comprehensive and comprehensive system, also requires the study of the geography of the area in question. Physical geography is concerned with the analysis of natural phenomena of the environment, such as landforms, climate, soils, plants, animals, and other natural phenomena. In terms of terrain, Mazandaran province is divided into two parts: plains in the north and mountains in the south, and its slopes run from west to east and parallel to the Caspian Sea. The Alborz mountain range, in the form of a high and long wall, encloses the coastal strip and the coastal plains of the Caspian Sea. Therefore, in all parts of Mazandaran, the slope and height of the land decreases towards the plain and towards the Caspian Sea. It should be noted that the natural and functional location of villages, which are usually closely linked to each other, also affects the size and extent of villages. The extent of rural settlements both indicates their capabilities and capabilities in accepting the population and is an effective factor in determining the shape and characteristics of the texture (or body) of villages. However, other factors, such as environmental conditions, economic production methods, social development, cultural structures, defense capabilities, and even legal foundations (including inheritance regulations) can play a role in the size of villages (Saidi, 1998). The geographic environment is the first and most important step in architecture. According to the above, environment and geography are influential factors in the formation of architectural spaces. And each environment has unique characteristics and capabilities. In the geographical area under study, rural housing is analyzed in three areas: plain villages, mountainous villages, and hill villages (Fig. 1).

Research Findings

• Housing in geographical areas; residential units located in the plains

Many villages are located in the foothill plains on the edge of the road to the sea. The plain area is narrower in the west of the province due to the short distance between the mountains and the sea and wider in the east. These areas have relatively large farmlands,



Fig. 1. Bala Bisheh Sar village. Source: Author's archive.

most of which were previously allocated to rice fields. Currently, these lands in the west of the province have been changed to a greater extent and have been allocated to villa construction. Native buildings are rarely seen and at a low level in this area, but in the east of the province due to its greater size and less tourist influence, its traces can still be seen. By studying the existing native examples, the physical characteristics of the buildings in these villages can be listed based on the components and characteristics that form the residential unit, as follows. Villages where agricultural lands are located in the middle of the village often have extensive areas, but in villages with a semi-dense texture (especially in large villages), the dimensions of the areas are smaller. In some cases, agricultural lands are adjacent to the area and access to it is through the area. Houses are often located in the middle of the field, and the field components typically include: a drain and a washing basin, a water well, an oil depot, a storage area for agricultural products, a toilet, a stable, and a hayloft, and an open space for keeping birds. The field components are often arranged either around the field and have radial access or are located linearly and axially. The field in this area is often enclosed by a masonry wall or a high fence. The entrance to the field has a door and usually has a gable with a sloping roof (Fig. 2).

• Residential units located in the foothills

The foothill villages of Mazandaran province are located at the foot of the mountains of the northern Alborz range. In some cases, these villages are formed on the slope, and in the lower parts, which are flat, the rice fields of the village are located, which in this case the village takes on a compact shape. Tea farming and especially gardening are common in the villages of this area. Gardening is mostly dedicated to citrus fruits, due to the suitability of the gentle slope for planting tea and the suitability of the climatic conditions, tea cultivation is very popular in such villages. In addition, due to the proximity of pastures, livestock farming is also seen at the level of household and semi-extensive use. The physical characteristics of the buildings of these villages can be listed as follows based on the components and

characteristics that form the residential unit: In houses located on the slope, the areas are relatively smaller, but if the houses are located in the flat parts of the foothills, the areas are larger. The houses are often located in the middle of the area. The components of the arena in this type also typically include: a water tap and a washing basin, a water well, a storage tank, a storage area for agricultural products, a toilet, a chicken coop, and an open space for keeping birds. The components of the arena are sometimes scattered and decentralized, and sometimes linear and axial.

• Residential units located in the northern Alborz mountains

The villages located in the mountains are often sparsely populated, have poor access, and limited facilities and amenities. In recent years, many of these villages have been deserted due to the migration of residents to lower villages. Also, many of these villages are used as summer residences, so currently many of these villages are deserted or have a small fixed population. Due to the cold weather and steep slopes of the land, these villages often do not have stable and prosperous agriculture. Their main meaning is often provided by animal husbandry, although extensive and extensive animal husbandry is also less common. Of the remaining villages in the mountains, most of them have become summer residences for villagers and urban residents of the plains. They live in these villages only in the summer season and sometimes take their livestock to graze on pastures in the cold season. This issue, namely the lack of permanent residence in the villages of this region, has given a special characteristic to the buildings located in this area, which distinguishes it from mountain settlements located in a cold climate that it is distinguished by its permanent residence so that due to the lack of full residence in the cold season in the villages of this region, we rarely see serious measures to combat the cold in these areas. The physical characteristics of the buildings of the villages can be listed as follows based on the components and characteristics that form the residential unit: Due to the location of the shelter on the slope of the compact

texture of the village, Due to the coldness of the region, the areas are often small, In some cases, the houses do not have areas or the areas are shared between several houses. Elements such as the water tap and washing basin, water well, storage, toilet, stable, and hayloft are considered components of the area and are sometimes located next to the passage and sometimes shared between several houses (Figs. 3 & 4).

Summary of Local Interviews and

Discussions

• Houses in mountainous areas

In the past, the kitchen was a service space next to the barn and livestock space and in greater interaction with the yard, but today its dimensions have become larger, closer to living spaces, but its privacy for the housewife has been reduced. In many modern houses, the vestibule or hall space, which was the boundary between the yard and the rooms, has been eliminated, and sometimes residents enter the main space upon entering. Given that the occupation of most residents was animal husbandry and agriculture, the courtyard was the location of service spaces such as barns, ovens, stables, and toilets, and was used for agricultural and livestock activities. In the months of the year when the weather was suitable, the veranda was used for activities such as cooking, dining, working, and resting, and sometimes for storing agricultural products. Today, the veranda has been replaced by a terrace, and the barn is used to store

additional items. Part of the yard is dedicated to the garden and green space for beautification and part to the parking lot, and the other areas are not used for the household’s livelihood as in the past. Finally, it can be said that today, the space in a rural house is formed based on cultural and social concepts and patterns, or lifestyle, in addition to the environment.

• Houses in the foothills

In the past, each house had an area with a set of service elements and spatial accessories such as a garden, a toilet, and various types of exploitation facilities related to agriculture and livestock, including a shed, a haystack, a stable, and a place to keep chickens and ducks, which were enclosed by walls made of tree branches or bundles of reeds called hedges. Today, due to the incompatibility of the plan of some of the built houses with the type of production activities, such as livestock farming in the villages, it has caused villagers to turn away from such activities and we no longer see spaces such as a stable, a haystack, a shed, etc. in modern houses, and the yard is used as a parking lot, a garden, and a green space. In this region, due to the climatic conditions, semi-open spaces were common and were used half of the year because these spaces allowed for air circulation while protecting from the sun. Semi-open spaces in this climate were built in two ways: either they had a veranda or a platform leading to a vestibule that provided access to the rooms. Semi-open spaces, in addition to their intermediary role, also played the role of horizontal awnings for windows and walls behind them. The



Fig. 2. Mohammad Abad Village. Source: Author’s archive.



Fig. 3. Lamzar Village. Source: Author’s archive.

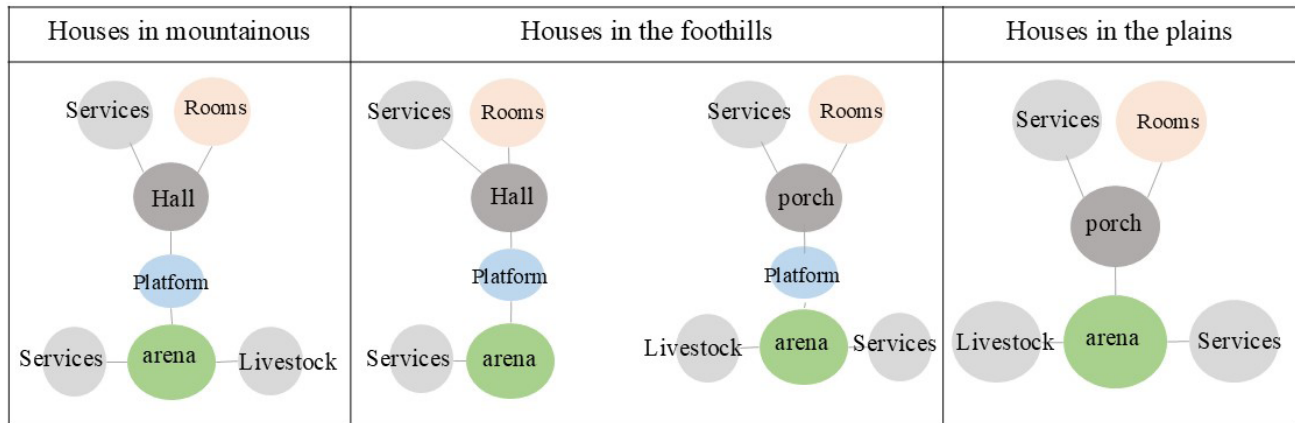


Fig. 4. Spatial relationships in rural houses in Mazandaran. Source: Authors.

traditional house model includes open, semi-open, and closed spaces, but today's buildings are limited to closed spaces. The elimination of courtyards and private open spaces from life and the need for their presence to fulfill related functions has ultimately led to the creation of terraces and balconies in new buildings.

• Houses in the Plains

In old buildings, due to the availability of abundant land, the number of spaces was greater and they had larger areas, and the areas were also wider. A barn was one of the main elements for storing equipment or animal feed. The toilet was also located outside the house and in the yard. In modern buildings, due to the lack of land and space and the high price of land, the buildings have become smaller in area and have increased in height in the form of apartments. In the plain areas where rice farming was considered the main activity, it seemed necessary to consider spaces for storing rice in the yard. Animal husbandry was also important for rice farmers as a side livelihood, and one or more heads of livestock were seen to meet the needs of family members, which justified elements such as a stable in the yard. Today, semi-open spaces are used to spread clothes, dry products, and rest. The stable has also been destroyed. Roofed verandas, which sometimes covered a large area, played an important role in using semi-open space, especially during the rainy season. On the other hand, due to favorable climatic conditions, a major part of life was spent in the veranda most of the year. For example: for eating, sleeping in the summer, taking advantage of the view of the garden, yard, and sky, but today the balcony or terrace is a modern form of the porch pattern in traditional houses.

Data Analysis and Achievements

The geographical area is the main factor affecting the type of housing in this region, which is divided into plain, foothill, and mountainous areas. The mountainous part itself includes two areas: the mountains of the northern slopes of the Alborz in the vicinity of the plains, which include the summer cottages of the inhabitants of the plain areas and are rainy and humid, and the mountainous areas of Baladeh and Kojur, which are located in the cold region with less humidity. Based on the statistical studies of the Islamic Revolution Housing Foundation in 2018, the Figs. 5 to 7 are presented to better understand the rural settlements of Mazandaran.

• Arena

Due to the climatic conditions and different seasons of the year, an important part of the livelihood activities of the villagers in Mazandaran province is carried out in the field of residential units. The elements located in the area of a residential unit, its shape, and dimensions, are affected by several factors such as location, topography, livelihood, climate, and similar matters. The most important points to emphasize in the area of residential units in Mazandaran province can be summarized as follows: The area of a rural residential unit is divided into biological, service, and livestock areas. Although livestock farming is common in mountainous and foothill areas; however, in the plain areas and some cases, the foothill areas of the province, due to the size of the areas, these divisions are more clearly and independently seen. However, in mountainous areas, due to the small size of the areas, greater compactness and interference of these areas are observed. Except in some mountainous areas, activities such as washing, baking bread, sometimes

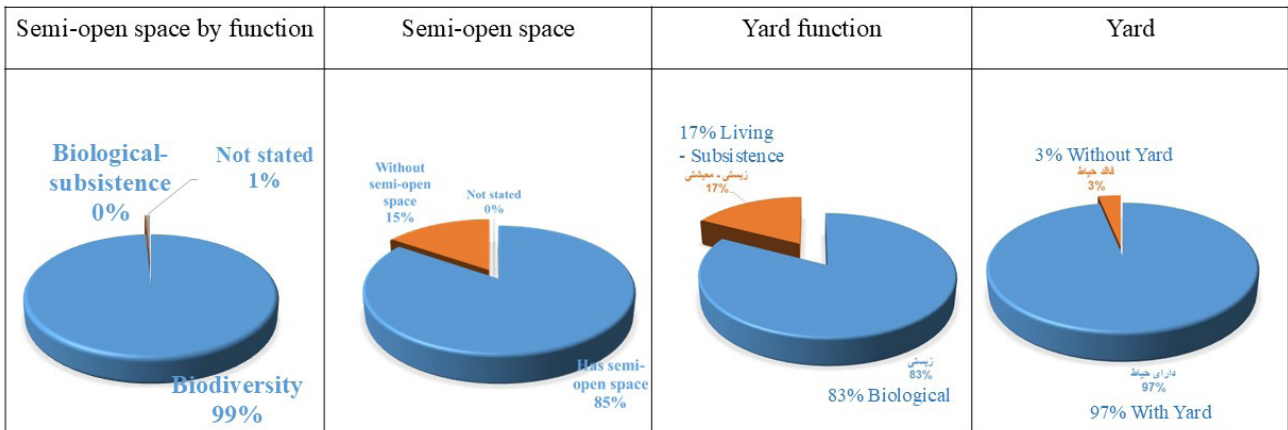


Fig. 5. Graphical analysis of livelihood activities in Mazandaran rural housing based on statistical data in 2018. Source: Authors.

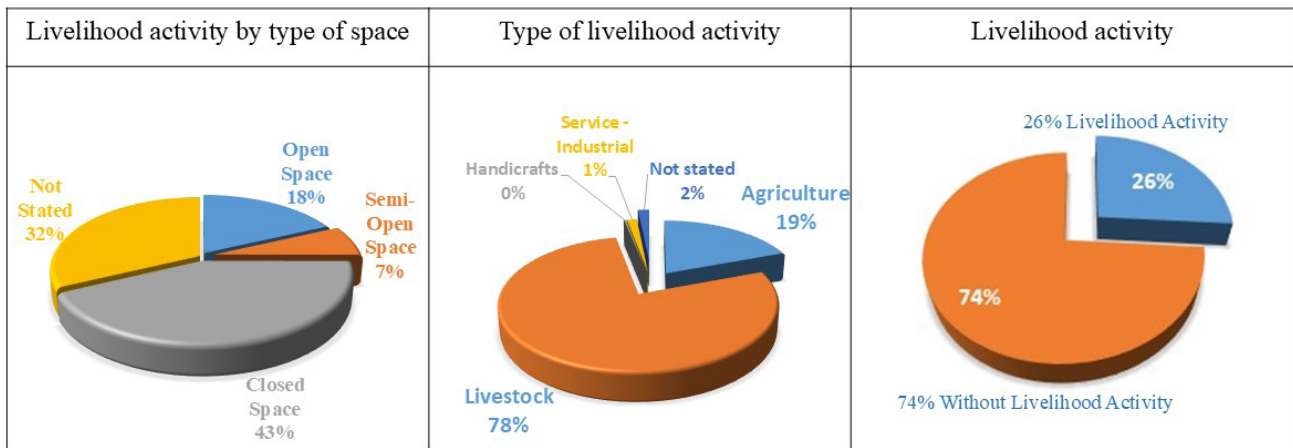


Fig. 6. Graphical analysis of open and semi-open spaces in Mazandaran rural housing based on statistical data in 2018. Source: Authors.

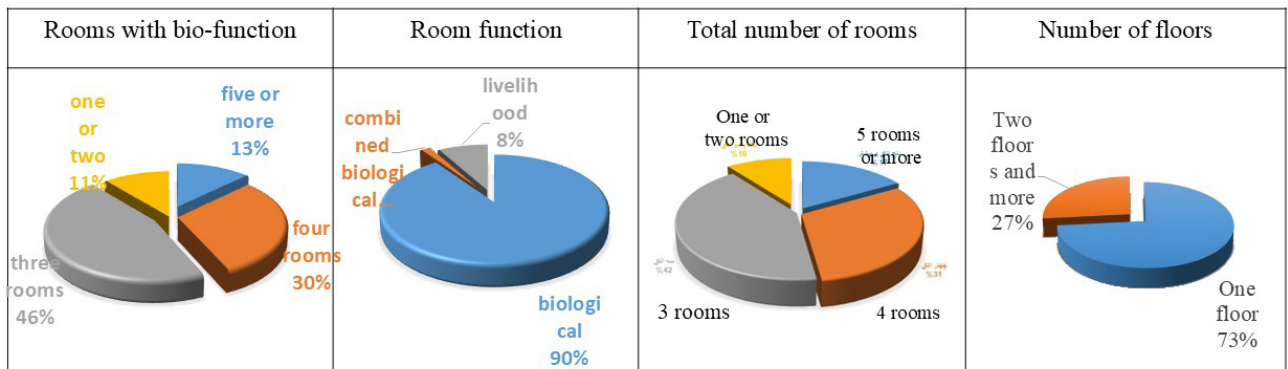


Fig. 7. Graphical analysis of rooms and floors in Mazandaran rural housing based on statistical data in 2018. Source: Authors.

cooking, and resting are carried out in the yard. Each of these activities has its own special space. The physical components and elements in rural houses in the region often include the following: a pond and a tap, a water source, an oil source, a spring, a vegetable garden, a fodder store, a ladder, a clothesline, or a pole, a chicken coop, a stove, and a place to store

agricultural machinery. The dimensions of the yard are different in forested and plain areas. The yard is relatively small in mountainous and foothill areas. The yard in rural plain houses has significant dimensions. To analyze the yards of rural houses, four houses in four different villages were selected from each area and are presented in Tables 1 to 3 below.

Table 2. Examples of native houses in foothill areas. Source: Authors.

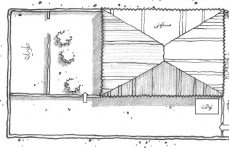
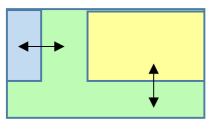

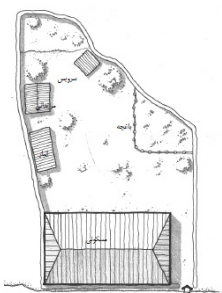
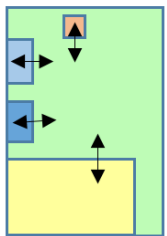

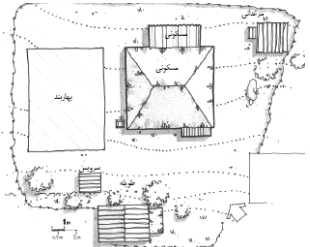
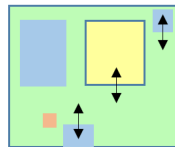

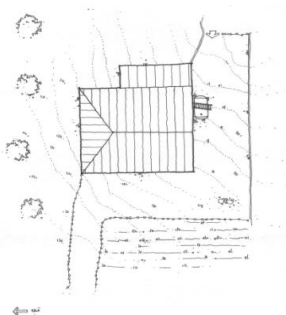
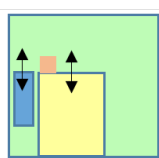

Mountain villages	Site Plan	Site Diagram	Image	Arena
Bijedeh No				Part of the area is separated by a brick wall, and the front part is not separated from the passage and public space. The space behind the house is walled and is dedicated to keeping livestock and poultry. The residential house is located on a sloping bed.
Chamar Kouh				The arena does not have a specific geometric shape. The entrance to the arena is located along the width of the building, and then the functional components of the arena, including the oven, stable, chicken coop, and restroom, are scattered and radially located. The middle space of the arena is empty.
Kodir				The spatial relationships of this arena are influenced by the slope of the land. The central core of the arena, where most of the arena movements take place, is formed near the entrance to the arena and at a lower height than the building. The stable is located at a distance from the house and on the passageway.
Lamzer				The area has a sloping surface and its boundary is not defined. The residential unit is located in the middle of the area and the entrance to the area is from the west. The most important physical components located in the area are: a residential house, a longhouse and a toilet. There is a garden in the area. The area is enclosed only on two sides.

Table 1. Examples of native houses in mountain areas. Source: Authors.

Plain villages	Site Plan	Site Diagram	Image	Arena
Bala Bishe Sar				<p>The area is stretched north-south and the residential unit is located in the middle of the area. The entrance to the area is from the south side. The most important physical components located in the area are: a residential house, a warehouse and a toilet. There is a pond and a water well in the middle of the area and a garden to its north.</p>
Tahmtan Kala				<p>The arena has an east-west extension and the residential unit in the middle of the arena is extended east-west. The entrance to the arena is from the east side. The most important physical components located in the arena are: residential house, garden, chicken coop, stable and toilet. The arena has a movement and visual enclosure from all sides.</p>
Futem Sofla				<p>The area is almost square and the residential unit is located in the middle of the area and the entrance to the area is from the south side. The most important physical components located in the area are: residential house, garden and toilet. The area has a physical and visual enclosure from all sides.</p>
Sarone Khil				<p>The area has a north-south extension, and the residential unit, which is almost square, is located to the west of the area, and the entrance to the area is from the west side. There is a citrus orchard to the north of the house and in the area.</p>

Table 3. Examples of native houses in plain. Source: Authors.

Foothill villages	Site Plan	Site Diagram	Image	Arena
Barsibor				<p>The area has a north-south extension and the residential house is located in the middle of the area. The entrance to the area is from the north. The arrangement of the elements is linear and along the north-south axis. The sanitary service is located near the entrance. Fruit trees are planted around the area.</p>
Afra Takht				<p>The area has almost square proportions. The residential unit is located in the corner of the area in an L shape. The entrance to the area is from the west side. The most important physical components located in the area are: residential house, warehouse, parking and toilet. The area has movement and visual confinement from all sides.</p>
Sava				<p>The area is small and lacks elongation, and the residential unit almost fills the area. Entry to the area is from the southwest. The most important physical components located in the area are: a residential house, a toilet, and a warehouse located under the residential unit. The area is enclosed on all sides to the south.</p>
Mohamad Abad				<p>The area is small and has a north-south orientation, and the residential unit with a north-south orientation is located in the south of the area. The most important physical components located in the area are: a residential house, a longhouse, a warehouse, and a toilet. The area is physically and visually enclosed from all sides.</p>

Conclusion

In the villages of Mazandaran province, the general structure of the relationship between spaces in a residential unit is based on the fact that the open space, known as the arena, surrounds the living space, which has different characteristics and dimensions according to the geographical location. Also, open and semi-open rural spaces, in accordance with the family's occupation, serve as living spaces. According to the diagram of spatial relations in houses in plain areas, the distance between the arena and the rooms and the living space is the veranda. In foothill areas, where the arenas are more limited, access to the rooms is defined either by a platform and a veranda or by removing the main veranda, the platform leading to the vestibule reaches the rooms. In mountainous villages, the veranda is often significantly removed and the platform leading to the hall defines access from the outside to the inside. Sometimes, especially in cold regions, the rooms have nested internal access. In mountainous areas, access to the rooms, in addition to independent access from the outside - which takes place in the warm seasons - is also connected through the middle hall. In general, direct access to the veranda is a necessity for most villages in the region. Therefore, first the veranda and then the room that serves as a living room and is usually located in the center of

the building; they play the role of the dividing space and the communication core of the building. In plain areas, the areas are wide and the units are scattered. In cold areas, especially in steep hills, the textures are more compact. In all cases, in native examples, the boundaries of residential units are less separated by walls and most houses are enclosed by hedges or planting plants. Based on the analysis of statistical data, most native rural houses are two-story, and more than half of rural houses lack space for livelihood activities. The most livelihood activity in the villages of the province is animal husbandry, which is often carried out in closed spaces. Most houses have yards and semi-open spaces, which are used more as living spaces. Given that the occupation of most residents was animal husbandry and agriculture, the courtyard was the location of service spaces such as storage, oven, stable, and toilet and was used for agricultural and animal husbandry activities. In the months of the year when the weather was suitable, the veranda was used for cooking, eating, working, and resting and sometimes for storing agricultural products. Today, the veranda has given way to the terrace, and the warehouse is used to store additional equipment. The traditional house model includes open, semi-open, and closed spaces, but today's buildings are limited to closed spaces. The elimination of the courtyard

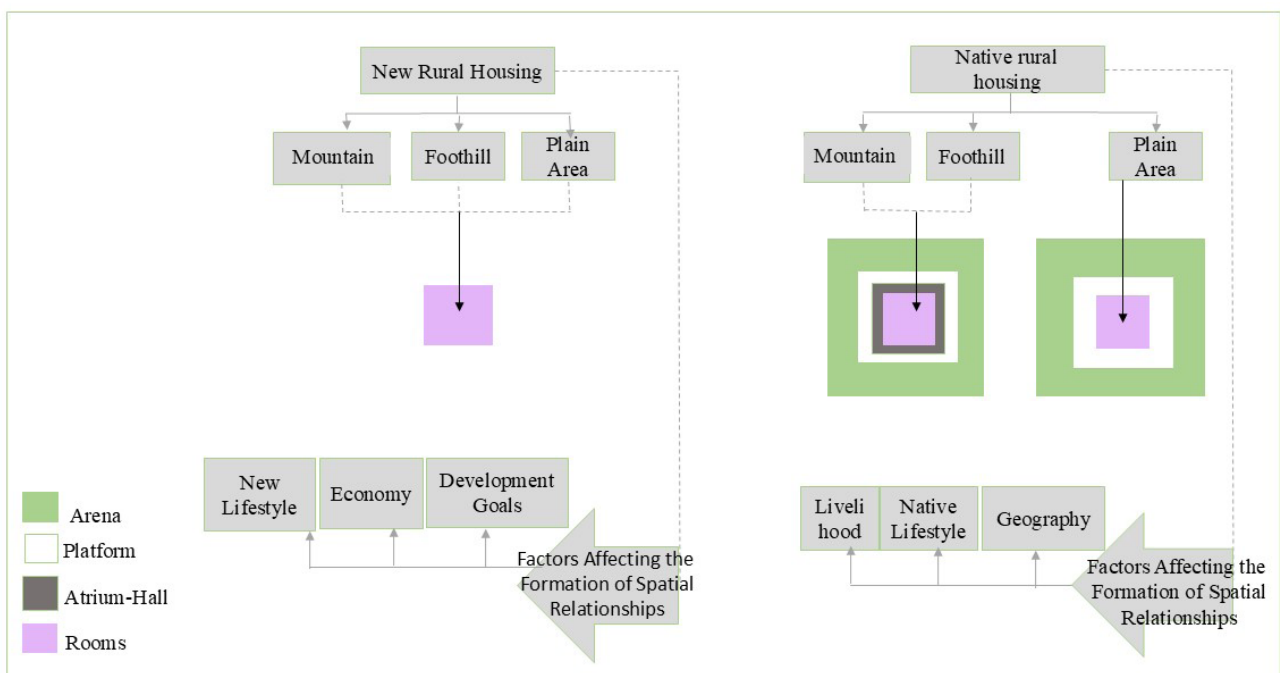


Fig. 8. Conceptual model of spatial relationships in rural houses in Mazandaran and factors influencing its formation process. Source: Authors.

and private open space from life and the need for its presence to fulfill its related functions has ultimately led to the creation of terraces and balconies in new buildings. In today's buildings, due to the lack of land and space and the high price of land, buildings have become smaller in terms of area and have progressed in height as apartment buildings. According to local discussions that examined the function and structure of open and semi-open spaces in the past and today, what is clear is that rural lifestyles have changed

over time. The increase in land prices has limited the areas, so not only geography but also many other factors play a role in the formation of the spatial structure of rural housing. In the development plan and the process of modernization, less attention has been paid to local characteristics, and regardless of geographical zoning, the formation of rural houses has been based on development goals and economic issues, which has ultimately led to changes in the lifestyle and livelihood of villagers.

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