Indigenous Housing of Villages in Markazi Province, Iran[1]

Mohsen Sartipipour, PhD
Associate professor
Department of Architecture -School of Architecture & Urbanism
Member of Research Center for Rural Architecture
Shahid Beheshti University, G.C., I.R. IRAN
Tehran, Iran

Abstract

Iran is a vast country with a rich climatic, ethnic and topographic diversity. About 60% of land area of Iran is comprised of rural regions. In the recent years with the emphasis put on the supply of suitable housing and environment for rural people, 200,000 rural housing units are being built annually. Markazi Province with a total rural population of 419,184 and 1,278 villages and an area of over 29,125 km2 (1.8% of the country's land area), is among the provinces where about 4,500 residential units should be built each year following the above-mentioned plan. According to the 2006 Census of Statistical Center of Iran, there are 99,842 rural housing units in this province. Due to existence of valuable indigenous rural housing exemplars in Markazi Province, and the necessity of being informed of the local architectural features and its bond with housing units under construction, conducting research on the rural architecture of this province is of significant importance. This paper deals with introduction of remarkable and widespread types of indigenous housing in Markazi Province and their features.

Keywords: Iran, Markazi Province, Village, Housing, Typology.

1. Introduction

Dwelling and housing construction have always been in proportion to socioeconomic transformations and development of existing facilities and technology in a society. The impacts of such factors are evident as changes in image of settlement and housing in different periods of the history. Rural architecture has not been the exception to the rule and has always been bonded closely with the cultural and social values and technical and environmental facilities of the community; while outstanding role of values, traditions and customs also has always governed it. Indigenous architecture is the result of current knowledge, art and technology in such communities, and while protecting and developing traditions, it helps preserving the values of the community and their cultural continuity. (Rapoport, 1982)

Villages are the population centers that their existence is depended on agricultural, livestock and horticultural activities and products and land-related activities, and their physical aspects have been organized in such a way that they would be responsive to such operations. Rural economy in Iran is largely dependent on agricultural, horticultural and animal husbandry activities and related operations which are partially traditional or semi-modern, and the level of physical transformations of villages has generally been in proportion to the stability or changes in such activities. From architectural viewpoint, housing is the main physical element of village which not only meets the socio-economic needs of villagers but also plays a major role in texture formation and identity of rural architecture. (Sartipipour, 2009) The contemporary developments have led to distancing from traditional patterns and favoring new patterns which have caused physical disorder and disharmony between housing spaces and living-subsistence requirements in some cases. Contemporizing rural housing knowingly and making it compatible with the community needs so that it would be both responding to today's needs and also ensuring continuation of ancient architectural values require being aware and informed of the principles of the formation of indigenous architecture and its values.

---

[1] This article has been written based on the data of a research titled *"Rural Housing Typology in Markazi Province"*. The research has been prepared under the support of Deputy of Research & Technology, Shahid Beheshti University.

The necessity to focus on such features is the major reason for conducting rural housing typology project in Markazi Province. Understating rural housing and becoming aware of common patterns provide good exemplars for designing, constructing, promoting and teaching the rules and regulations governing the formation of them.

2. Research Methodology and Selection of Sample Villages and Houses

Given the vastness of the province and large number of villages and housing, adopting a rational and scientific method for selecting samples plays a determining role in quality and validity of the results of research. Therefore, based on geographic, climatic, economic and demographic indicators which cover all climatic features, types of common jobs and potential population of rural settlements of the province, 35 villages were selected from 1,278 villages. Housing characteristics also were studied and analyzed by selecting 104 residential units in the sample villages using random sampling method, and conducting studies and preparing architectural drawings of them.
Subsequently, after collecting information about the physical and economic characteristics of housing and using descriptive-analytical surveys and written and library-based studies, the factors effective in formation of texture and housing were analyzed and finally, dominant rural housing types were identified.

3. Markazi Province: an Introduction

Markazi Province is one of the historical centers of residence in Iranian plateau which is located almost in the geographic center of Iran. The province is part of the central plateau of Iran between the Alborz and Zagros Mountains and adjacent to Iran's central desert between latitude 33 degrees and 30 minutes and 35 degrees and 35 minutes north, and longitude 48 degrees and 57 minutes to 51 degrees east of the Prime Meridian. In terms of topographic features, 33.91 percent of the province area is covered with mountains, 14.93 percent with hills, and 13.76 percent with plateau and the rest with plains. According to the latest division of the country, the province consists of 10 counties, 18 districts, 27 cities, 61 rural districts and 1639 inhabited and uninhabited villages. Its cities include Arak (center of the province), Saveh, Khomein, Mahallat, Sarband (Shazand), Tafresh, Delijan, Ashtian, Komijan and Zarandieh.

Height difference between the lowest point in the province, i.e. Saveh plain with a height of 950 meters above sea level, and the highest point, i.e. Shahbaz summit with a height of 3,388 meters, is about 2,400 meters and this difference is an important factor for the diversity of climate and weather in the province. The annual mean precipitation is from 170 mm in Saveh plain and some southeastern areas to 450 mm in highland areas over 2000 meters high. Mean annual temperature is from 18° C in Saveh plain to 4° C in the highland areas.

Metal, textile, non-metallic minerals, chemical and petrochemical, pharmaceutical and food industries are the major industries in the province and important sectors in economy of the province include services, industry and agriculture sectors respectively. Agricultural sector is one of the most potential and most important economic sectors in Markazi Province, and is providing 26.5% of employment and is meeting all food needs of the area.
Rural population of the province in the year 2006 has been approximately 419,184. There are approximately 3,000 nomadic households (0.4 percent of the population of the province) living within the province who are mostly settled in villages, summer resorts and pastures.

4. Components and Elements of Texture and Housing

Physical environment of villages in the province has been formed in proportion to geographical and climatic conditions of the area and under the influence of environmental, social, cultural and economic regulations. Self-sufficiency of rural people and their strong motivation for life and production have lead to the formation of appropriate methods to cope and coexist with nature, or to control and exploit it for satisfying their needs throughout history. This lifestyle has given certain features to rural texture and housing such as its harmony with geography, topography, climate, subsistence practices, beliefs and etc. (Sartipipour, 2010) Villages located on slopes have short narrow, steep and sometimes stair-like passageways. Texture density is low in the villages located in temperate climates, while it is higher in cold areas. Texture density in cold regions makes heat exchange between inside and outside spaces to become minimized.

Rural houses of the province are the centers for living, producing and subsistence activities. In comparison with the urban housing which is a merely living space, such features have led to formation of a series of diverse and multiple living and subsistence functions in villages.

The living spaces include room, porch, yard, foodstuff warehouse, kitchen, storehouse for equipment, sanitary spaces (such as toilet and bath), while subsistence spaces include shed, stable, barn, Baharband, slum and storage space for agricultural and garden crops. The structural elements include foundation, ground course, walls, pillars and roofs which are primarily constructed of masonry materials including stone, brick and adobe for ground courses and walls, and wooden beam for roofs. Rural housing rehabilitation projects in recent years have replaced traditional materials with new ones. Housing components and spaces include:

4.1. Room: Rooms are simple spaces with a few small niches, and one or two openings which usually have several functions for leisure, living, eating and sleeping. The living section of the house is consisted of one or more adjacent rooms that are sometimes directly opened to an open space, and sometimes there is a porch on front of them which is a boundary between indoor and outdoor. (Sartipipour, 2010)

4.2. Porch: A semi-open and semi-enclosed space, as the boundary between closed and open spaces with some living and sometimes producing functions. Almost all activities conducted inside rooms can be transferred to the porch at the proper seasons of the year. Also some part of production activities such as drying garden products and producing handicrafts, etc may be done in this space. Porch is located on the ground floor or first floor, and sometimes on both floors. More than half of the houses (65 percent) of this province have porches which are generally located at south direction.

4.3. Kitchen and tandoor: In the not too distant past, using wood or dried animal waste as fuel was very common in the villages of the province. Cooking food using such fuel was carried out in old kitchen spaces called Matbakh. Changes in fuel pattern within the past three decades have caused the space be used less frequently and its activities would be transferred to the kitchen which is a cleaner environment. Tandoor room has also been one of the important spatial elements of houses used for baking bread or cookies. Tandoor-rooms are often closed spaces located in the corner of the yard and sometimes are merged with kitchen.

4.4. Warehouse: This space has had two functions, i.e. serving living spaces or supporting subsistence spaces. In the case of serving living functions, it is usually associated with kitchen or rooms and its main function is storage of equipment and foodstuff. In the case of supporting subsistence function, it is considered for storing agricultural or horticultural productions or agricultural tools and equipment, raw materials for handicrafts, or livestock products and forage.

4.5. Sanitary spaces (bath and toilet): These are covered and simple spaces usually with minimal facilities that are small having approximate dimensions of 1.5x1.5 meters and 2.5 meters high. These are usually located in the corner of the yard and far from living spaces and are enclosed. If the village has no piped water, a water tank will also be installed near them or on their roofs and sometimes there is a common drainage well for both of them.

4.6. Yard: The most important open space of the house, where most of the activities begin and end up, and it is also the intermediary between closed spaces. Closed spaces in some areas are located around the house so the yard is completely enclosed and becomes the spatial and functional center. In other examples where closed spaces are in one or two sides of the house, it is less enclosed. The average size of the yards has been 215 m2 in studied samples which indicate its significant role in the housing. (Typology project, 2010)

4.7. Entrance: It is the space that provides access from outside to inside of the house. The internal space of the house is considered as the dedicated space for the family, so it as an intermediary between outside and inside and makes outside-inside connection possible. The location of the entrance is so that the inside of the house could be protected from being viewed by strangers. In residential units of households who have large number of livestock, sometimes human and livestock entrances are not the same, however in most houses, especially the units which belong to the households with fewer livestock, the entrance is shared between them.

4.8. Micro-architectural components and elements of house: stairs, windows, doors, niches, shelves and etc are other architectural elements that are seen in most houses. Stairs provide access to upper floors and roof and have a simple shape. It is a functional element, and this is evident from its shape and proportions. The stairs are few in number with approximately 40 cm rise height so that connection between two floors would become possible with the minimum building area.

Doors and windows are other necessary and additional elements which in addition to providing access and maintaining security, are responsible for providing light for enclosed spaces. Doors are usually 80 cm in width and 180 cm in height and are generally made of wood. The width of the windows also follows the same sizes and they have a small surface area. In most cases, no full length window can be observed and windows are located at a height of one meter above floor level.

4.9. Shed: productive subsistence activities are an important part of villagers' life in Markazi Province which has a significant impact on the organization of texture and housing. The largest subsistence spaces in the studied samples include shed, barn or warehouse for storage of garden products. Livestock is kept in shed that has an important role in living and subsistence of livestock farmers. This space is about 3 m in width, 6 meters in length 2 to 2.5 meters in height. If the number of livestock is high, the space can be extended or the number of sheds can increase. In the case of small number of livestock, the space allocated for large and small farm animals can be shared, however their area will be separated by a fence built within the shed. In the cold mountainous regions with generally two-story residential units, sheds are on the ground floor or under buildings, while in one-storey buildings these are located adjacent to residential spaces. In cold regions where cold winter may lead to sickness or even death of livestock, a space will be dug under the ground which is called Zagheh, i.e. slum. Due to being located underground, the space is protected from outside temperature fluctuations and provides a warm and suitable place for keeping livestock.

During spring and summer that weather is good an open (unroofed) space surrounded by the fence is prepared near shed and barn for livestock that is called Baharband.

4.10. Barn: A space where forage needed for livestock is kept there. In houses of households who have low number of livestock, sometimes barn and shed jointly make up a single space. In houses of households who conduct agricultural or horticultural activities, some warehouses are made for keeping agricultural tools and machinery, seeds, pesticides, fertilizers etc.

5. Hierarchy of Visual Perception of Rural Texture and Housing

Rural architecture in Markazi Province, due to its natural and humane origin and the needs from which it is originated, is formed in harmony with nature, and that is why it has a kind of beauty that make the environment pleasant and humane. Villagers in Markazi Province have shaped their places and physical textures and housings based on their understanding of human and nature and the relationship established between living and subsistence activities in proportion to such demands. In review of image and perspective of villages of the province, hierarchy of visual perception, from macro to micro scales, can be categorized as follows: (Sartipipour, 2010)

The first level is related to the place identity of the location of the village. At this level, locating occurs in a place which seems to be understandable by the viewer and in an overall scale. At this level, the figure of the village and its location within the context of the natural environment is viewed and reviewed. The viewer's perception from village and its figure includes the natural environment and landscape where the village is located as a spot. At this level, rural nature is the most important aspect of perception.

The second level of dealing with village is the level of texture and landscape and includes viewing the balance between physical forms and environment. At such level, village is perceived from a closer look on physical textures, and more vivid images of the physical forms of the village will be obtained. Texture, skyline and landline and visual signs have a determining role in the perception of the environment at this level.

The third level of perception of rural environment is when the observer is within the texture and start to understand the place (texture) and environment through observing various within-texture perspectives. At this level, components, forms and composition of houses are viewed together and sensory perceptions become more comprehensive.

The fourth level of perception is at house level, which is accomplished through being in it and observing the architectural components of residential unit. The level is the place of manifestation of taste of family in building a house. Aesthetic capacity of human being and rural sincerity and contentment come together as simple elements with appropriate shapes to satisfy the beauty-seeking needs of rural people.

5.1. Aesthetic Elements of Housing

One of the most important aesthetic aspects of rural texture and housing is the potentiality of using and activating the five senses. The size and composition of the buildings, color and texture of materials, entrance, companionship of mass and space, façade, shelves and niches are among aesthetic elements of residential units that interact with the environment to provide the conditions so that senses, especially hearing, seeing, touching and smelling, can be engaged. The simplicity of the built environment and its harmony with the environment is so that sometimes transcend the observer beyond the perception of appearances of the environment and make him/her use the hidden aspects of perception and think about what is derived from human nature. The visual appearance of residential units is generally simple and unadorned, often asymmetric and a combination of rectangular or square forms which are placed at various depths to each other. There is no large variety of openings and they are generally uniform. The bottom of windows is at a height of 80 cm above floor of the rooms and they are typically 110 to 140 cm in height.

Types of materials and final coatings of façades play a decisive role in the beauty of houses. Cob coating using local soils or mineral soils with different colors and applying straw with which the villagers are familiar and have affinity with, has given a specific identity to their architecture. Because of its nature and warmth of its color, wood has caused a good companionship with cob-coated walls and has created pleasant forms and colors for façades. Due to being natural and local, indigenous materials have a special color, texture and smell and make the walls warm, touchable and humane.

The overall shapes of houses are a combination of cubic modules with close sizes and dimensions and flat roofs made of wooden beams or barrel vault, which usually embrace the yard. The porch is intermediary between the yard and living spaces, and is a semi-open space that in addition to playing functional roles provides a combination of full and empty spaces that enhances the visual quality of the façade.

The entrances to the houses are simple, usually wooden and often two-leaf. The entrance is sometimes covered and roofed, and in some cases there are platforms on both sides of them for sitting and chatting which in addition to performing such function, place more visual emphasis on the entrance.

6. Summary and Conclusion

The studied housing units in the Markazi Province with regard to the combination of full and empty spaces and their common aspects, differences and distinctions can be categorized as the following 6 general patterns: (Sartipipour, 2010)

Housing Type No. 1: Spatial organization of this type is in such way that the mass of the space is located at two sides and the yard is between them. Almost half of these housing units are two-storey buildings. In this type, living spaces are usually located at one side and service or subsistence spaces at the other side of the yard. The yard, with average area of 243m2 has an important role and some activities such as washing and milking livestock are carried out there.

The average land area is 599m2 and the building area is 253m2. The average living floor area is 198m2 and livestock-subsistence floor area is 99m2. 58 percent of residential units have a porch. Building materials of walls are mainly adobe (70 percent) and brick and roofs are often flat (80 percent), constructed using wooden beams while the rest are vault roofs. Most of these residential units (68%) are located in very cold semi-arid climate and the rest are located in cold semi-arid and cold semi-desert arid climates respectively.

Housing Type No. 2: The mass of filled space in this type is L-shaped and located at two adjacent sides of the land and the remaining space is dedicated to the yard. Most of these residential units (65 percent) are two-storey buildings. Living spaces are usually located at one side and service or subsistence spaces at the other side. The average land area is 431m2 and the building area is 206m2. The average yard area is 194m2 and in addition to being a place for some functions such as washing, milking livestock and growing vegetable is also an intermediary for spaces. 55% of residential units of this type have a porch.

The average living floor area is 179m2, with 70m2 of it dedicated to rooms and livestock-subsistence floor area is 61m2.

Building materials of walls are mainly adobe (67 percent) and brick and roofs are often flat (74 percent), constructed using wooden beams while the rest are vault roofs. Most of these residential units (48%) are located in very cold semi-arid climate, 31% in cold semi-arid climate, and the rest are located in cold semi-desert arid and very cold semi-humid climates respectively.

Housing Type No. 3: The mass of filled space in this type is located at three sides of the land and is U-shaped, and the yard is located within these three sides. Most of such residential units (73 percent) are two-storey buildings. This type of housing is the most common pattern for rural housing with abundance of 34%. Living spaces are usually located at one side and service or subsistence spaces at the other two sides. The average yard area is 150m2 and is a place for some functions such as washing, milking livestock and keeping livestock. The average land area is 396m2 and the building area is 233m2. The average living floor area is 207m2, with 78m2 of it dedicated to rooms and livestock-subsistence floor area is 87m2. Building materials of walls are mainly adobe (78 percent) and brick and roofs are often flat (64 percent) constructed using wooden beams while the rest are vault roofs and steel beams have also been used for a small number of them. 55% of these residential units are located in very cold semi-arid climate and the rest are located in cold semi-arid and cold semi-desert arid climates respectively.

Housing Type No. 4: In this type, the mass of space is located into two separate parts so that the residential units have actually two yards at either side of the mass of space. 60% of these housing units are two-storey buildings. In this type, usually living, service and livestock spaces are as independent masses next to each other. The average yard area is 489m2 and in addition to being a place for some functions such as washing and milking livestock is also an intermediary for spaces. The average land area is 918m2, of which 416m2 is filled space and the rest is empty space. Most of the residential units of this type have a porch. The average living floor area is 357m2 with 106m2 of it dedicated to rooms, and livestock-subsistence floor area is 225m2. Building materials of walls are mainly adobe and 57% of roofs are flat, constructed using wooden beams while the rest are vault roofs. 60% of these residential units are located in cold semi-arid climate, and the rest are located in cold semi-desert arid climate.

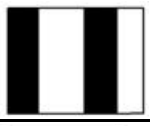
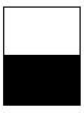
Type	Shape	Description	Full/empty space ratio
1		Mass of space at two opposite sides with the yard between them	1.15
2		Mass of space at two adjacent sides (L-shaped) with the yard between them	0.92
3		Mass of space at three adjacent sides (U-shaped) with the yard inside them	1.46
4		Yard (empty space) at both sides of the mass of the space and dedicated yards to separated humane and livestock functions	0.85
5		Mass of space around the yard (central yard pattern)	2.9
6		Mass of space at one side and the yard at the other side	0.46

Table 1: Dominant indigenous rural housing types in Markazi Province

Housing Type No. 5 (Central yard pattern): in this type, the mass of the space is located around the yard and the yard is at the center of the mass. About 57% of housing units are two-storey buildings. The average yard area is 96m^2 and like other types, in addition to being a place for some functions such as washing and milking livestock is also an intermediary for spaces.

The average land area is 449m^2, of which 323m^2 is filled space and the rest is empty space. The average living floor area is 244 with 109m^2 of it dedicated to rooms. Building materials of walls are totally adobe and 71% of roofs are flat, constructed using wooden beams while the rest are vault roofs. 86% of these residential units are located in very cold semi-arid climate and the rest in cold semi-desert arid climate.

Housing Type No. 6: In this type, the mass of space is located at one side and the yard at the other side. 70% of housing units are two-storey buildings. Living and subsistence spaces are located at the same side. The average yard area is 262m^2 which is allocated to flowerbed, parking lot and washing spaces and other living spaces.
The average land area is 400m^2, of which 138m^2 is filled space and the rest is empty space. The average living floor area is 204m^2. 81% of residential units of this type have a porch. The average living floor area is 177m^2 with 74m^2 of it dedicated to rooms. Building materials of walls are mainly adobe (56 percent) and brick, and roofs are often flat (65 percent) constructed using wooden beams while the rest are vault roofs and steel beams have also been used for a small number of them. 46% of these residential units are located in very cold semi-arid climate and 31% in cold semi-arid climate, while the rest are located in cold semi-desert arid and very cold semi-humid climates respectively.

References

Alalhesabi, M. (1992). *Rural housing pattern: research in rural architecture in Khorasan Province*. Tehran: Islamic Revolution Housing Foundation.

Cataldi, J.C. (1987). *Initial typology*. Translated by Gholamhossein Memarian, Tehran: Donya-ye Nou Publications.

Habrakn, N. J. (1998). *Diversity in housing*. Translatad by Golara Faridian and Nasser Yazdkhasti. Tehran: University Publication Centre.

Islamic Revolution Housing Foundation of Markazi Province (?). Guide Plan of Azbizan, Chalsban, Ezzildin, Khoin, Noor Ali Beig, Yasblagh Villages.

Kasmaei, M. (1999). *Climate and architecture*. Tehran: Baztab Publication in cooperation with Iran Housing Corporation.

Rapoport, A. (1982). *The meaning of the built environment: a non-verbal communication approach*. Beverly Hills: Sage Publication.

Rapoport, A. (1997). *Cultural origins of living complexes*. Translated by Raziyeh Rezazadeh, Tehran: University of Science and Industry.

Sartipipour, M. (2010). *Typology of rural housing in Markazi Province*. Research and Technology Department, Tehran: Shahid Beheshti University.

School of Architecture and Urban Planning (?). *Monographies of Markazi Province Rural Architecture*. Tehran: Shahid Beheshti University.

Statistical Center of Iran (2006) 1996 and 2006 Population and Housing Census.

Valikhani Chegeni, F. (2008). *Cultural Atlas of Markazi Province*. Markazi Province Broadcasting Center.