

The Influence of the Landscape on the Typology of Traditional House in Kurdistan Mountainous Villages

Ayoob Khaleel Ismael (PhD) * and Hikmat Abdulaziz Hamad (PhD)

Department of geography, College of Art, Salahaddin University-Hawler Kirkuk Street, Erbil 964,
Kurdistan/Iraq *E-mail:ayoobgeo@gmail.com

Abstract

Every natural environment impacts the society that inhabits it and studies on mountainous regions all over the world have substantiated this claim. The impact of natural environments can be seen in the architecture, life and culture of those who live in mountainous regions. The influence of architecture is physical and caused by the geography and climate of the mountainous regions and the practical difficulties involved in constructing buildings. For centuries traditional houses used locally available materials. It is only from the early 20th century that traditional homes began to change in terms of the housing materials used. Traditional architecture in Kurdistan was largely built without formally trained professionals. No architect or planner ever designed a traditional house. The planning of a traditional house was developed by the people according to their needs. Traditional houses have changed over time to fulfill the demands of the inhabitants. The aim of this paper is to identify the natural design principles of traditional houses in Kurdistan according to availability of local materials. Different kinds of house such as mud and stone house were developed in different regions of Kurdistan. Many designers are now interested in adapting traditional features to modern design but such attempts have had limited success because traditional house design have not been clearly understood. This study can help to develop an understanding of traditional house designs by analyzing traditional homes in the mountainous regions of Kurdistan.

Keywords: traditional house, typology, environment, mountainous region

1. Introduction

The natural environment has molded the life of the humans who inhabit it. Throughout history, special traits have been attributed to specific groups of people inhabiting specific geographical landscapes. The natural surroundings of a people have an impact on their food, clothing, housing, social bonds, economy, culture and attitudes. Thus nature becomes an all-encompassing presence that gives meaning and definition to the lives of people. In this study, the influence of nature on traditional homes in a mountainous rural area was investigated. In the mountainous regions examined here, traditional housing is rural housing, as confirmed in a study by Habitat (Habitat, 2001).

Traditionally housing is designed by the resident based on low investments and local materials combined with the assistance of relations, friends and neighbors. Traditional housing reflects the cultural heritage of people and it also an expression of traditional values (Rumana, 2007). The practice of drawing on traditional architecture to inform contemporary design has been promoted by many theorists and distinguished architects such as Hasan Fathy (Steele, 1988). Among the advantages claimed by these architects, is that there are many benefits to be derived from centuries of experience in adapting form and material to achieve comfort in relation to the local climate. In Kurdistan rural development is threatening these traditional homes. Concrete dwellings, which are characterless, thermally inefficient and expensive to run (Figure 1), are replacing the traditional village housing, which is environmentally efficient, made of renewable materials and able to be built largely with sweat equity.



Figure 1. Use of modern material

As a result, it is essential that Kurdistan takes a sensitive approach to solve this problem. However, before any attempt can be made, it is essential to know what the traditional houses in Kurdistan are. The goal of this paper is to evaluate the designs of the traditional homes according to typology. Traditional homes are influenced by the locally available materials, climate, and the economic resources of the home owner.

2. Landscape of Kurdistan region

The Kurdistan region of Iraq covers the mountain land, uphill and the most fertile plain part of Iraq. The lowest point in the region is Kifri, which has an elevation of 140 meters above sea level, and the highest point is the Peak of Hasarost Mountain in Erbil governorate, measuring 3,607 meters above sea level (Nqshbandi *et al*, 1998). Kurdistan region mainly extends across the Zagros Mountain up to Taurus Mountains, Figure 2. The north-northeastern part is characterized by the Iraqi Zagros Mountain range with heights up to 3 600 m above sea level (Wright&Minneapolis, 1961). This range separates the three Governorate of Northern Iraq from Turkey to the north and from Iran to the northeast. In this area morphology is rather rough, with steep slopes and narrow valleys. Snow coverage is common at high altitudes and vegetation cover is widespread, constituted of both grasses and forests (Travaglia and Dainelli, 2003). A smoother morphology occurs in the central part; the area being characterized by an anticline/Syncline system (Boccaletti and Dainelli, 1982) which gives rise to a relief with a general orientation Northern West-Southern East. Heights up to 2000 meter above sea level are reached. Wider valleys occur in this zone, which are strongly influenced by tectonic control. Vegetation is rather sparse, mainly herbaceous. The southwestern part is dominated by the low alluvial plains of the Tigris River and its tributaries. Average altitude is around 400 m above sea level.

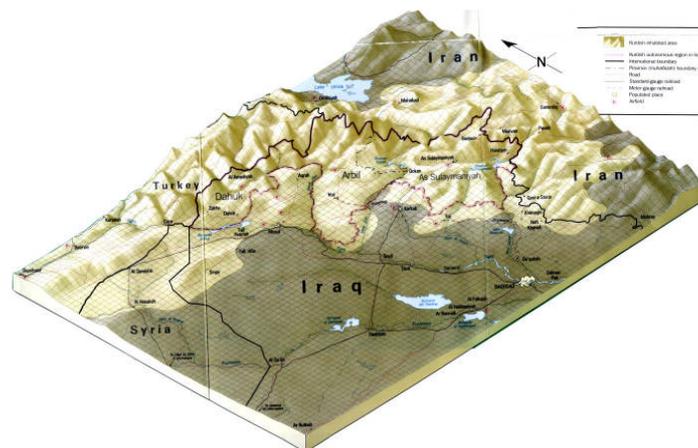


Figure 2. Physical map of Kurdistan Region

3. Historical Development of the Traditional Housing

Even though the Kurdistan is a historically important region and it was home to one of the earliest civilizations, archaeological excavation efforts in the Kurdistan region were restricted and many sites remain hidden. However, there were invaluable archaeological investigations in Kurdistan in the 1940s and 1950s, which discovered a number of mysteries not only about the antiquity of Kurdistan but also about the beginning of human civilization. Professor Robert Braidwood, Linda Braidwood, and their colleagues (Braidwood, R. *et al*, 1960; Braidwood, L., 1983) holds a prominent position in this respect. They have established beyond any doubt that Kurdistan was one of the first cradles of humankind and it witnessed the beginning of the Neolithic/agrarian revolution about 9,000 years ago. The development of human dwellings in Kurdistan Region has passed through three important stages:

3.1 Cave stage

Geological and archaeological evidence revealed that Kurdistan has been settled since the Upper Paleolithic era, which coincided with the first stage of the last glacial period in Europe. The economy was dependent on wild

animals. Communities formed on the basis of joint work activities and some degree of kinship (Braidwood & Howe, 1960). There is no doubt that the natural environment in the mountainous region of Kurdistan offered the right circumstances for early humans to settle in rock shelters and caves to protect themselves from the cruel environment and from their enemies. The Kurdistan region has numerous caves that record the existence of humankind. These caves include: Zirzi, Hezarmerd, Pelgawra, Barak, Hajieh, Kaiwanian, Babakhal, Spilk and Shanidar Caves. One of the most important caves in the region is the Shanidar Cave located in the valley of the Great Zab on Bradost Mountain and it is about 637m above sea level. It was excavated from 1957–1961 by Ralph Solecki and his team from Columbia University and it yielded the first adult Neanderthal skeletons found in Kurdistan, dating from 60–80,000 years BC. The excavated area produced nine Neanderthals skeletons of varying ages and states of preservation and completeness (Solecki, 1954).

3.2 Commuting stages

This stage is considered to be a transition period between the cave stage and building the first settlements that were constantly inhabited. In this period, human commuted seasonally between cave in the winter and temporary structures during the warmer months. The commuting stage in Kurdistan was a time of transition from the Paleolithic (Old Stone Age) cultures to the Neolithic or New Stone Age, in which farming appeared. An example of a settlement created during the commuting stage is Karim Shahir, an open site on a terrace of the River Zab in Iraqi Kurdistan which has given its name to a culture dated circa 9000 - 7000 BC. It is associated with the transition from hunting and gathering economy to one based on farming. There is little evidence of permanent structures at the Karim Shahir site as most structures were probably occupied seasonally meaning that the people of this time were nomadic and somewhat sedentary. At Karim Shahir clear proof was obtained both of the knowledge of grain cultivation in the form of sickle blades and of the baking of clay in the form of lightly fired clay figurines. The economy at this time was based on hunting with some possible evidence of herding and the artifact evidence also suggests an increased dependence on plant resources (Braidwood & Howe, 1960).



Figure 3. Scatter of cracked limestone pebbles at Karim Shahir (Braidwood & Howe, 1960)

3.3 Settlement stage

In Kurdistan, for the first time, humans began to leave their caves, and instead built homes to live in. About 3,500 years before Europe, Northern Iraq was the scene of the Neolithic revolution (Braidwood, 1960). On the foothills of Kurdistan watered every winter by Atlantic rains, man ceased to be a wandering hunter, depending upon his luck and skill for his living and became a farmer, attached to a small piece of land from which he obtained a regular food supply. Out of clay he built himself a house. He secured sheep and cattle as permanent and easily available sources of milk, meal, wool and hides. At the same time, his social tendencies develop. The care and defense of land called for close cooperation with his neighbors. Each family probably worked their own farm, cultivated their own field, grazed their own flocks, and made own tools; but several families would come together and from a hamlet, the embryo of social organization (Braidwood & Howe, 1960). An example of the settlement of this stage is the village of Zawi Chami, which is considered to be one of the oldest settlements in the world. Archeologists estimated that is dated from 10000 B.C (Saed, 1984). It is located near the Shanidar cave and just 95m from the Great Zab River. The location of the village near to Shanidar cave can be explained by the reason that the people used the cave during harsh winters, especially since we know that the material used in their buildings was not strong enough to stand against natural forces.

Another important early settlement in Kurdistan is the village of Jarmo, located near the city of Chemchal in an Intermountain area (Figure 4). Based on the findings of professor Braidwood, 95% of the animal bones found at Jarmo were of fully domesticated animals, especially goats and sheep. The culture of this period was based on productive farming as represented by the remains found on Kul-tape and other villages. The most interesting feature of this period is the absence of any hunting weapons. The tools were made out of flint and obsidian. The

plant remains belong to cultivate wheat and barley, and the bones only to domesticated animals (Braidwood & Howe, 1960). At this time rainfall had increased and the territory became suitable for cultivation. As a result, the settlement gradually moved from the foothills to the plains. Barter between different tribes increased when the communities depended largely on farming and livestock-breeding. These activities provided more generous and constant sources of sustenance. The result can be observed in the rapid increase in the population as the settlements continued to grow (Ibid).



Figure 4: A house with turf walls and reed bedding for floors- Jarmo architecture (Braidwood & Howe, 1960)

4. House typology characteristics

The typical architecture in mountainous regions in Kurdistan is characterized by “the lack of technology is substituted by creativity and through trial and error in using available materials and basic building structures” (Habitat, 2001, pp.3). This is evident by the building materials used by people in this area as they commonly use stone to construct their houses because that is the most readily available material (Figure 5). Another feature of homes in this area is that very little mortar is used in bonding the stones used to build the walls, which provides very good thermal control. But a negative aspect of such stone walls is that they prone to easy destruction by natural forces (Habitat, 2001, pp.23).



Figure 5. A house constructed of stone

To cope with the “contour layout” of the land, houses in mountainous regions are usually arranged in a stairway form or a semicircular design (Figures 6 and 7). In addition to stone construction in mountainous regions, mud brick or brick is also commonly used in construction, because mud is one of the cheapest building materials available. A house using these materials is also well suited to the cool climate of mountainous areas. By placing the houses in the valleys, the damage from the wind is minimized and also more sunlight falls on the houses so that people can better cope with the cool climate.

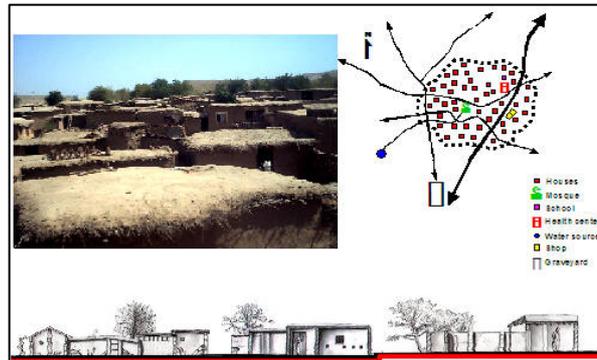


Figure 6. Semi-circular rural settlement (Habitat, 2001)

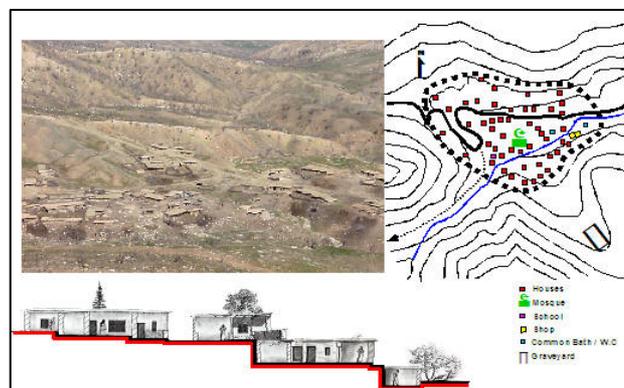


Figure 7. Stairway form of a rural settlement (Habitat, 2001)

In the study conducted by Habitat (2001) in Kurdistan Region-Iraq, it was found that houses were constructed facing southwards so that they would receive the maximum amount of sunlight (pp. 10). The contour design is also useful in preventing landslides and allowing for the drainage of excess water when it rains. This design, which is defined as “housing aggregation” becomes necessary also because such a structure is more convenient to defend against outside threats (Habitat, 2001, pp.10). The Kurdistan province of North West Iran is another example of a mountainous dwelling place. As in the Kurdistan region/Iraq, the houses here are also oriented towards the south allowing them to receive the maximum amount of sunlight in the winter and minimum amount of sunlight in the summer. In these homes, the windows are vertical for the same reason (Bahrami, 2008, pp.3).

In the Kurdistan region, the houses are generally placed “along the ground steps design”. The interesting factor of this design is that each house can use the rooftops of the house above it, as its courtyard (Figure 8). This is also unique in the sense that a community aspect is added to the concept of a house, which is generally considered to be strictly private property. This design is called a “terrace” design and it is preferred because in mountainous regions, there is very little land available for human use, meaning that people must minimize the use of land for dwelling purposes and leave more land for productive activities. The same reason explains why there is usually very little space around the dwellings (Habitat, 2001, pp.10).

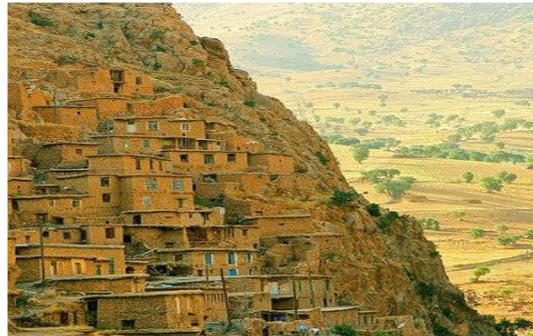


Figure 8: Terrace design

In the mountainous regions of Kurdistan, concrete slabs were laid on the floor of the majority of homes, but in many other mountainous places, mud floors are common. To prevent heat loss, windows are usually small openings or they may be even reduced to ventilation holes. It is also common to provide cross ventilation through vent holes (Habitat, 2001, pp. 24). But in Kurdistan, the design of these houses can cause humid conditions of making it cold inside the houses, which in turn makes people sick (Bahrami, 2008, pp.6-8). In Kurdistan, roofs are generally made of wood and mud as simple thatched roofs that might fall off in the wind and also because wood is a cheap available raw material, often there will be a layer of thatching in between the wooden beams and the mud coating above (Figure 9).



Figure 9. Roof of house in a mountainous rural area

5. Implications for housing design in mountainous rural areas

The typological investigation into traditional houses was conducted to produce a dwelling that is better related to the reality of the people in the area and capable of satisfying housing needs. As a consequence, the outcome will affect the population of Kurdistan in terms of rural development. Using modern designs and techniques in combination with conventional and traditional design could result in a sustainable and achievable long-term sustainability outcome for a design that definitely suits to the local social structures.

Paying attention to dwelling design and making useful houses based on the local environment supports the physiological conditions of village people. Currently, the situation of the world has resulted in lifestyle changes and created new needs for these residents. Paying attention to homes is very important. As mentioned earlier, the dwellings in mountain areas are built according to the domestic activities and source of income for each family.

Normally, the plot is small and without any fences, the area around the dwelling is open and almost all activities take place outdoors (Figure 10). Bahrami in a study of Zagros Mountain settlements affirmed that, in order to provide an appropriate house design for mountainous villages it is very important to pay attention to the effects of the environment on the design and shape of buildings and their layout. Bahrami also stated that it was important to pay attention to the direct effect of climate on peoples' activities. Based on Bahrami's claim it is important to review building production in Kurdistan area based on following points:

- 1- Proper site location for villages especially for new buildings. Places with better climate conditions should be allocated for living, educational services and interment buildings and buildings for stores, and industries, can be built in places with comparative lower climate conditions.
- 2- The layout of the building is important to protect them from climate risk. Two factors are very important in building layouts; they are sunshine and heat.
- 3- The plan and design of buildings must be changed to respond to environmental conditions. For example, the direction of buildings should be from north to south. This placement makes better use of sunshine and decreases ice in the alleys in the winter.
4. In addition to design consideration, climatic problems influence the construction techniques to create a comfort in dwellings. Apart from the different construction methodologies, the diverse use of local materials, stones, timber or mud bricks, provides the advantage of reducing temperature constraints. (Bahrami, 2008)

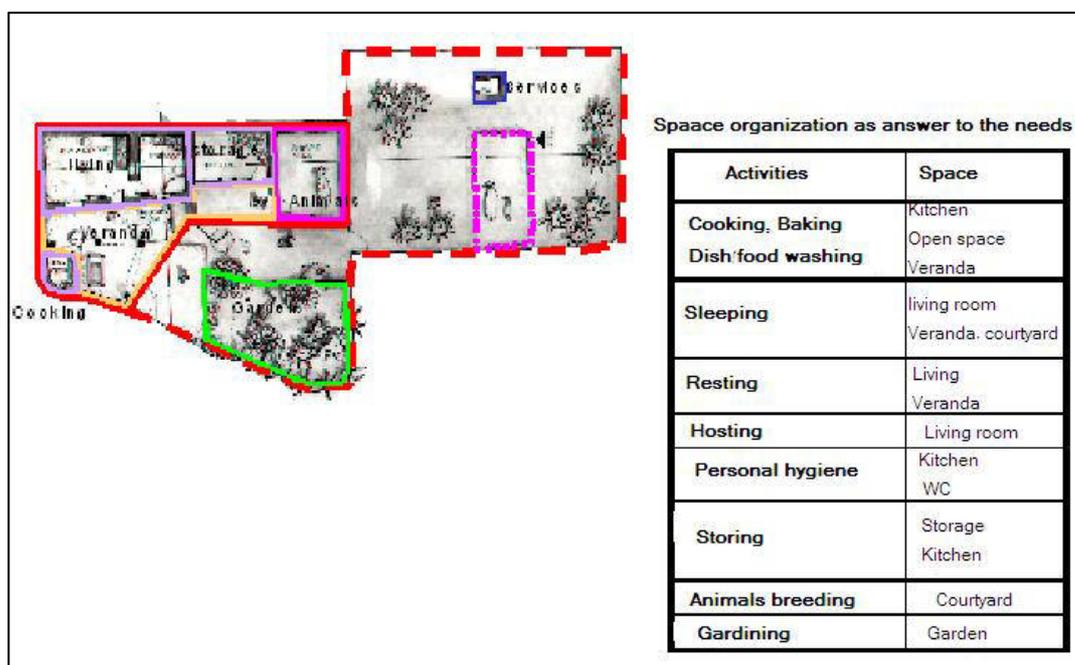


Figure 10. Proposed House design in mountainous areas (Habitat, 2001)

People typically sustain themselves in rural Kurdistan through cattle breeding and farming practices, the type of soil, the fertility of the land and the prevalent vegetation. These factors influence where settlements develop. On the other hand, the adequacy of the environment encourages housing construction. It is worthwhile noting that site vegetation determines the settlements disposition and location. The presence of high trees and plants acts as a natural barrier for protection against strong winds and currents. At the same time, it also provides a source of firewood and material for construction and fencing. Directly connected with the land fertility and the presence of vegetation is the availability of natural water sources. The presence of water is the most important factor that encourages a community to settle. Rivers, streams or natural springs are identified as the main reasons behind the formation of settlements (Habitat, 2001).

6. Conclusion

The environment imparts an inherent rhythm, style and character to the lives of people. This is because humans are not separate from nature. The influence of the natural environment of the people of mountainous regions is more intense because they are more isolated from other modern influences. This is what makes them a unique.

Recently, however, attempts to make mountain inhabitants build and renovate their dwellings are posing a threat and affecting the landscape of mountain regions. The increasing use of cement and block concrete as main building materials is a matter of concern and needs to be addressed immediately. Traditional homes of Kurdistan reflect a deep understanding and response to the local environment and climate. Traditional houses play a vital role in natural disaster such as harsh climatic conditions, floods and strong winds. The traditional houses of Kurdistan are well suited to their climate with its various types of local materials that create an effective environment for living. There are no doubts that today's youth can gain a lot of very good knowledge and solutions from traditional homes, which can be subsequently used to create a sustainable architecture for Kurdistan.

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