

Analysis of the Fabric of Hawramane Takht Village from Natural and Climatic Point of View

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1 ABSTRACT

The population growth and human's need for a suitable settlement, serious increase in energy and fossil fuel consumption over the past years and human interference in the nature led him to think of new methods of climatic design of the settlements and conservation of fossil fuel that he could get his requirements without harming the natural environment.

The village of Hawramane Takht is the centre of Hawraman township of Servabad country which is located in the southwest of Kurdistan province, Iran.

The village is a precious form of climatic and natural architecture which can be seen as an extreme use of solar energy and fossil fuel conservation. The fabric and spatial structure of Hawramane Takht village is generally formed by a set of neighborhood units, footpath and public open and enclosed spaces which are on a high slope in the middle of the mountains by a close relation to each other and an organic interaction with natural environment.

Severe shortage of land to be developed, cold climate and mountainous area are the leading causes of a dense complex settlement in the middle of mountains which provides a combination of positive and negative surfaces. In this pattern of mountainous architecture, the roof of each house (building) is the yard of the house above or a part of public footpath. The connection and coherence on public context image and serial juxtaposition method toward south in order to prepare the light and heat are features of this architecture.

Now in the analysis of fabric structure and architecture of the village, the role of the architectural design to respond climatic issues is more understandable. Organic and entirely functional structure has composed a special typological architecture which has its own sensible traits as following items:

1. Adapting to Organic architecture basis.
2. The lowest interference in the natural environment.
3. Harmony of structural architecture with the organic topography and natural environment.
4. Applying the local natural materials.

Precise analysis of the fabric of this village, could lead us find best methods to design new settlements especially in cold regions, more climatically to make a better environment and save more energy to conserve it to next generations.

Keywords, Hawramane Takht village, climatic design, energy conservations, fabric of village

2 INTRODUCTION

Human has thought of settlement to protect him from learning wild animals, extreme weather and any dangers which might threatens them. It is noticeable that architecture has not been formed from the begging and as times went on and human's try efforts and the lasting influence of environment on human to have the idea of improvement are most important elements of forming the conceptual architecture.

3 REASERACH METHODOLOGY

In the theoretical research relevant concept and definitions of sustainability and vernacular settlements were studied in the experimental research, required information was collected through survey methods in a descriptive –analytical way in Hawraman-e Takht village. In this research by analysis of the village of Hawraman-e Takht and its architectural and environmental features and also by paying attention to theoretical methods of organic architecture and using solar energy in this village, a complete report of fabric texture and location is achieved that can be gained a special climatic design which can be used in similar areas.

4 IS THE ARCHITECTURE IN HARMONY WITH THE NATURE?

Could human improve his architecture without harming the nature and its environment? The village of Hawraman-e Takht is a valuable paradigm of an organic architecture with its residents by having a good concept of the nature and environment ,climatic designing and best usage of solar energy could build a village like a town without damaging the nature and environment, which although is located in ragged mountains but could have the communications with its own feature for the sites which have similar climatic conditions.

5 GEOGRAPHICAL LOCATION OF THE VILLAGE OF HAWRAMAN-E TAKHT (HAWRAMAN-E TAKHT FROM THE HEIGHTS)

It is the center of Uramanat which is located in southeastern Marivan with a 75Km road linking to Marivan this village is located in an East –west valley in a steep declivity opposite the northern side of the Takht Mountain.^[1]

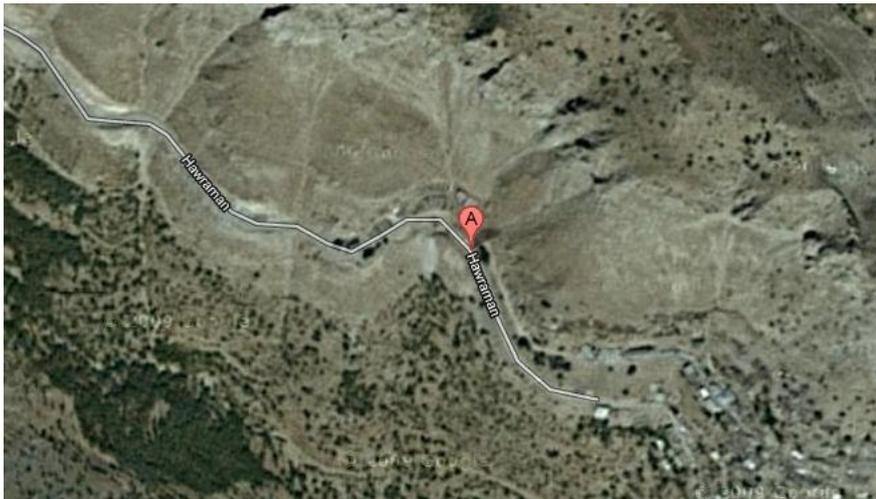


Fig. 1: Satellite map of Hawraman-e Takht

5.1 Why this area is called Hawraman Takht?

Hawraman is comprised of two words "Hawra" or "Hura" which means Ahura and "Man" the meaning house, a place and land. Therefore Hawraman means an Ahuraic land or the land of Ahuramazda. In Avesta "Hur" means the sun and Hawraman means the place for the sun.^[2]

6 CLIMATIC CONDITIONS OF THE VILLAGE OF HAWRAMANE TAKHT

Hawraman-e Takht and Marivan are located in a very cold mountainous region which has cold winters with long snowfalls and short and cold summers. This area is very high in comparison to the sea and is surrounded by Northern Zagros mountain range which causes extreme weather and difficult climatic conditions.



Fig. 2: Hawraman-e Takht in winter

7 WATER RESOURCES

Permanent spring waters, and water well and "Sirvan" river are the main water resources. Sirvan is a significant water resource that two parts of this river reach this area from North and southeast, and after they meet each other in a place called "Duab" and then leaves Hawraman and Kurdistan province and finally reaches to Darbandikhan dam in Iraq.^[3]



Fig. 3: Sirvan River

8 LAND USE IN THE VILLAGE

The natural environment including high slope lands, stones and root rocks have made almost 52.7% of the village lands to be useless but the main land usage is residential (26%) and street networks (13.8%) and the other land uses are educational religious, healthcare , business and manufacturing.^[4]

9 ARCHITECTURAL TEXTURE OF THE VILLAGE

The village is a precious form of climatic and natural architecture which can be seen as an extreme use of solar energy and fossil fuel conservation. The fabric and spatial structure of Hawraman-e Takht village is generally formed by a set of neighborhood units / footpath and public open and recloses spaces which are on a high slope in the middle of the mountains by a close relation of each other and an organic interaction with natural environment. Severe shortage of land to be developed, cold climate and mountainous area are the leading causes of a dense complex settlement in the middle of mountains which provides a combination of positive and negative surfaces. In this pattern of mountainous architecture, the roof of each building is the yard of the building above or a part of public footpath. The connection and coheres on public texture image and serial juxtaposition method toward South in order to prepare the light and heat are features of this architectures.

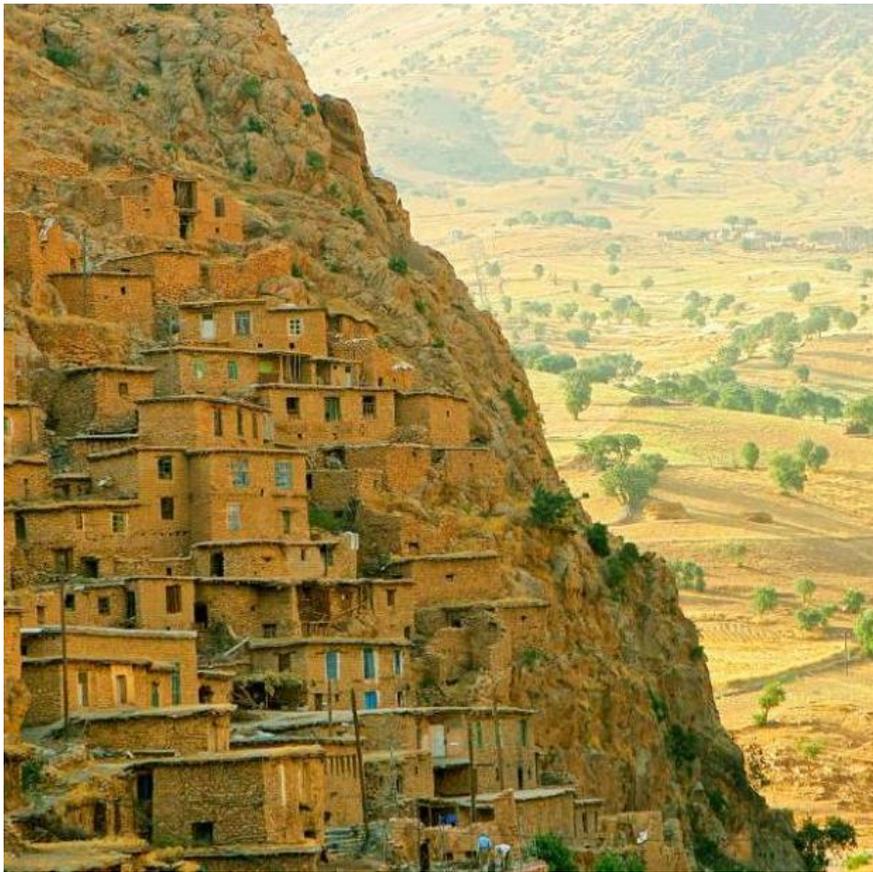


Fig. 4: Hawramane-Takht Texture

10 ARCHITECTURAL FEATURES OF THE VILLAGE

One of the most important architectural features of the village is obeying the architecture rules; here are some of those features:

10.1 Nature and environmental conservation:

The construction in the village has not damaged the nature, unique stairway architecture is according to the high slope of the mountains there, that the village is constructed on a very high slope of the mountain base. This form of architecture even does not harm the nature and is accepted as a part of the nature which is a kind of respect for the nature and the facade is like to come out of the nature and is a part of the mountain itself.

10.2 Using the local materials:

Local and mountainous materials have been used in the architectural texture construction of the village in which houses are built with pieces of stone piled upon each other without the use of any construction materials. Any materials which harm the nature are not seen at all in this village, the texture of each building in the village is quite similar to the nature of Hawraman which is seen as a part of the nature.

10.3 Form follows function

In the construction of the village the function is not only considered although form and function are combined, for instance, in the stair way shape of the village the roof of each house (building) is the yard of the house above or a part of public footpath as a response to high slope of the mountain and the form completely follows the function.



Fig. 5: Stair way shape of the village

11 ARCHITECTURAL FEATURES OF THE VILLAGE IN RELATION TO CLIMATIC DESIGN

We could consider the feature below in climatic design and features of fabric texture design of the houses of the village.

11.1 Orientations of the buildings

The connection and coheres on public texture image and serial juxtaposition method toward South in order to prepare the light and heat are features. Using solar energy is very vital due to difficult transportation of fossil fuel.



Fig. 6: Buildings toward South (using solar energy)

11.2 Access for pedestrian and motorist

Because of high slope of the village the access of the motorist is just in the entrance of that via asphalt way, and the whole part of the village there is only pedestrian access, the mountains which its width sometimes are less than 2m and continues it the summit of the village by passing over the roof of the buildings

11.3 Dimensions of the windows

The windows are designed on the Southern and Eastern sides in which are vertical and their width are 1.40m maximum in order to use the maximum solar energy in cold seasons. In some cases that windows could cause heat loss, they are eliminated. In fact minimalism is noticeable. If Usage of windows is necessary, they are thin, otherwise the wall texture is without an opening.



Fig. 7: Window

11.4 The gauge (thickness) of ceilings and walls

The thickness of ceilings and walls are, in a specific shape which heat conductance is prohibited, it means that the walls and ceilings with high thickness protect the inner heat in winter and the buildings stay cool in summer.

11.5 Materials

The materials which are used have high heat capacity; they hold heat and prevent the heat loss. Local wood has been used in making doors and windows and also wood has a vital role in columns and covering the ceilings.



Fig. 8: Stones without the use of any construction materials

12 CONCLUSION

In the analysis of the village of Hawraman-e Takht by consideration of climatic architecture design basis, a conclusion can be reached that in the modern world which technology and population growth rate and fossil fuel consumption is very high and energy resources have decreased significantly in recent years, by analyzing environmental features of each area on organic architecture basis, fossil fuel conservation and pollution reduction would be gained and by using local and organic materials and solar energy, leads us to have an organic sustainable architecture which is economically reasonable.

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