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Evaluation of architectural harmony tirjerd village, with its prevailing climatic conditions

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ABSTRACT

Application of climate, many things has been carefully studied. One of these areas, with applications in architecture and architectural adaptation and climate, a lot of research in this field has been carried out. This is in line with the plan, and reducing energy losses, as well as human welfare, it is necessary. This study, based on an analytical method - statistical survey Tirjerd village architectural harmony, with a climate that has been done. To this end, we first examined the climatic conditions prevailing in the district, in terms of (temperature, humidity, wind and comfort day or night) it was paid. To this end, data from weather stations that Abarkuh Yazd, extracting the required information from them, were processed, and then estimating the particular circumstances of architecture and materials needed for this condition, examine the residential fabric of the villages were. Materials and how to build houses in this village, assess and then adapt to the prevailing climatic conditions of the district were. Our results indicate that, Tirjerd housing village, just on the basis of geographical and environmental conditions governing it, is formed, and the lowest energy, and sustainable development objectives, in addition to, and past due several years of experience, have achieved this.

1. Introduction

The best way to understand the environment in which we are, of building traditions of local people there. Building with nature, respecting the surrounding environment, ie, understanding the climate, taking into account the position of the land, and the natural elements, the wind and sun, and other features, in particular, is characterized by its location (Zandi, Arabi, 2010). Thread climate architecture, one of the interesting subjects in studies of climatic factors on housing and human living space. Architects, in the past, the experience, the effects of wind and sun and rain, the houses and buildings are well known and interesting ways to reduce the adverse effects of these factors are present. Contemporary architecture, environmental changes due to climate and sustainability criteria, appears every day becomes more important. In fact, Ecology Building, building capacity to integrate environment and climate, and convert them to quality, space and comfort are emphasized form (Jovdat, 2001). If the design of a building, the Essential Tips to compatible climate, not paying attention, the interior of the building itself, even with the natural thermal comfort, the external environment can, to create adverse temperature conditions. Inconsistent with the indoor climate conditions, they can not even use the heating and cooling system, the reasonable cost, as well as setting (Kasmaee, 1988). With that humans are influenced by natural factors, however, having been a factor in intelligence, aptitude, and art, in a word the organization and tool making, over centuries, to move towards development and progress. Because of the consistent and flexible architecture of the climate and temperature of each zone, the best, the rest is used (Qarehnejad, 2002).

Estimates of comfort in harmony with the climate, or the impact of climate on the housing context, a lot of work done, which can include Warren Johnson (1997), in an article describing the traditional architecture of the Middle East, climate adaptation, and Olegi (1973), and Giony (1997), with models Bioclima building, trying to study and identify the necessary conditions for human thermal comfort them, and each model offered. In Iran, many people in this field, operated, it can be Said J., in 1998, to evaluate the climatic environment, and building thermal needs, Tabriz pay, and Ghaemi (2000), Research Report as (climate effects on humans), the country's Meteorology and Asian M. et al, in 2004, in general, to study climatic characteristics, and its role in architectural harmony, in order to optimize fuel consumption and power Iran began. In this research, the importance of the issue, to identify the degree of match Tirjerd village housing architecture, its climate has been.

2. Location of the study area

Abarkuh district, with an area of 5785 square kilometers, 140 km West of Yazd is located. This district has two zone “central “and “Bahman ", and four Tirjerd villages, Fragheh, Mehrabad and the Esfandar. Abarkuh, on the way to a branch of the Silk Road, which in the past has been prosperous and populous. Tirjerd is village functions Abarkuh central city in Yazd Province. Tirjerd Village, one of the village of Abarkuh district, the northern Abarkuh district, and the easternmost province of Yazd is located.

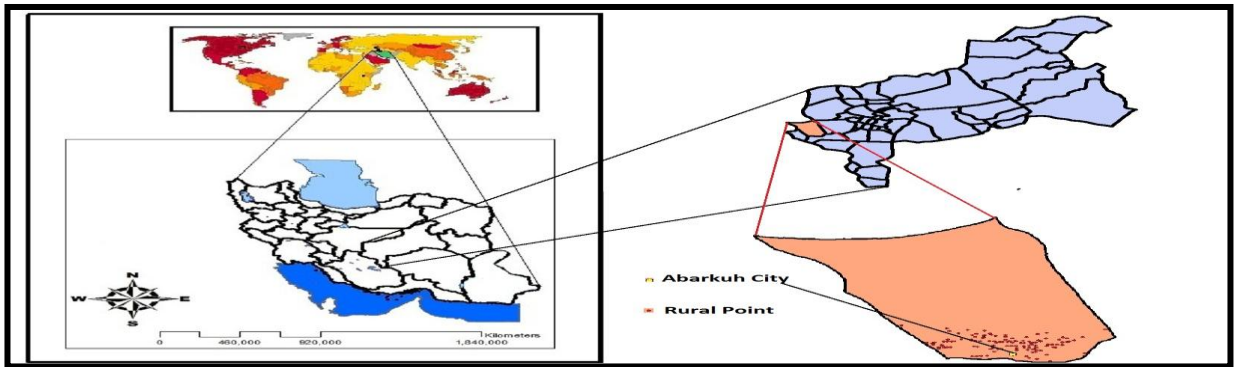


Fig. 1. Tirjerd villages, and the rurals studied.

3. Methods

This study was designed to investigate the extent of tissue adaptation Tirjerd residential village, with its prevailing climatic conditions, is formed, and for this purpose, we have evaluated the climatic conditions prevailing in the city, due to (temperature, humidity, wind and daily comfort and night), it was discussed. Therefore, the data Abarkuh station, the Yazd (www.chaharmahalmet.ir), the period (1964-2005), extracting the required information from them, were processed, and using the software Excel, the diagram was drawn as needed, and then estimating the particular circumstances of architecture and materials needed for this condition, examine the context of these villages were inhabited, and materials and how to build houses in this village, assess and then adapt to the prevailing climatic conditions the city was.

4. Climatic characteristics tirjerd village

In this paper, to evaluate the climatic elements (wind, temperature (minimum and maximum), relative humidity (minimum and maximum)), disbursed in accordance with the terms and conditions of Architecture, has been evaluated.

5. Temperature

According to Table (1) Charts (1 and 2), which represents the temperature of the mean, minimum and maximum requirements, it may be that, by comparing the average daily temperature and average maximum temperature seen huge differences between them, and However, comparing the mean maximum and minimum temperature difference between them, severe environmental conditions would have, because it comes from the desert region, and the lack of vegetation in the area, and also due to the lack of rainfall, and thus reducing the relative humidity, extreme temperature fluctuations, will be seen during the day, and due to the mountainous region, and the heat capacity of rock, soil is less than that of the lead early in the day was warming, and during the night his temperature rapidly lost, resulting in a cold environment, and since the sky area over the years, often without the cloud cover, the heat lost from the atmosphere, and the earth not opening round, and this will be followed by cooling environment, meant to be given this situation, materials and textures to be used in these villages, which prevents the rapid warming during the day, and cool it during the night, and the other measures be considered in the construction of houses during different times of day, providing comfort for residents.

Table 1
Temperature Average, minimum and maximum Tirjerd village.

Variable Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temperature	1.9	4.4	8.8	14.9	19.7	25	27.6	26.2	21.8	15.5	8.9	4.1
The minimum temperature	-5.3	-3.7	0.8	6	10.6	15	17.9	15.8	11.1	5.8	0.3	-3.3
The maximum temperature	9.2	12.5	16.8	23.5	28.9	35	37.4	36.5	32.5	25.3	17.4	11.5

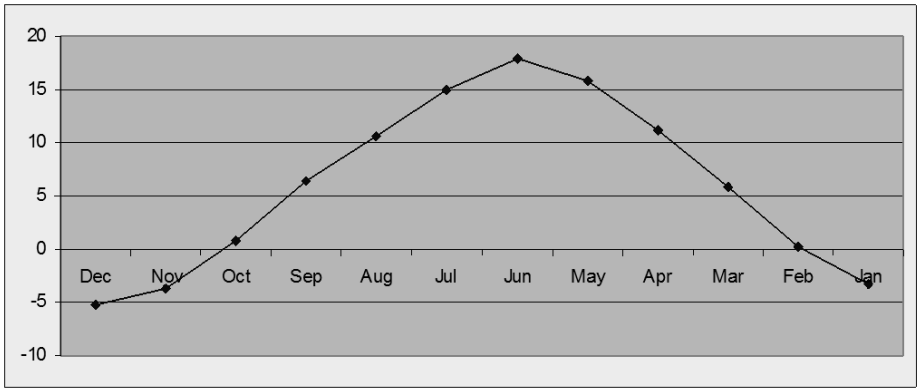


Fig. 1. Average minimum temperature of the Tirjerd village.

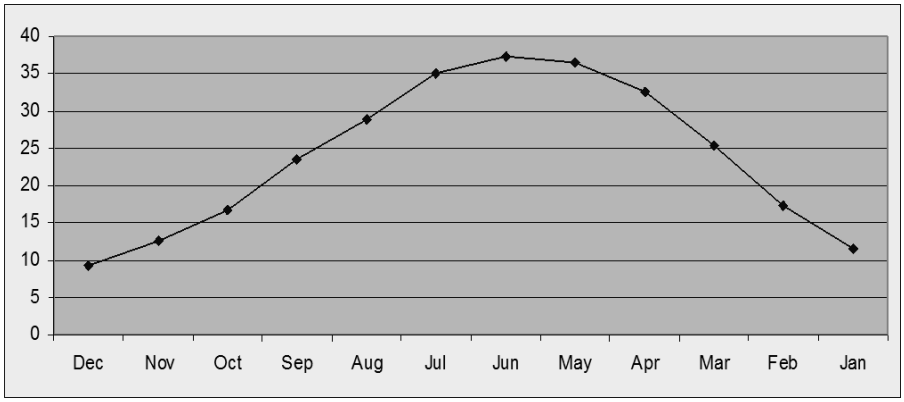


Fig. 2. Average maximum temperature of the Tirjerd village.

6. Wind

Wind variable climate is such that the speed and direction of its significant impact on human welfare, he will be in a residential context (Karimi et al, 2010). According to Table 2, the wind speed and direction at the Tirjerd village show, we discover that, in most months of the year, the wind direction was

west, and on the other hand, we noticed that the wind speed, in the district during the year, the wind is blowing very rapidly, after considering the circumstances of the houses east - west, and the need for them either to the north or to the south, and the other residential structure be such that the direction of destructive winds to keep people from harm.

Table 2
direction and wind speed in Tirjerd village.

Variable / Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
wind direction	270	270	270	270	270	270	270	270	270	270	270	270
Wind speed	4.3	5.7	6.7	7.4	7.3	6.8	6.4	5.7	5.1	4.9	4	3.7

7. Terjung Index

Terjung Index, one of the most important methods in human biology, climate, human comfort can be considered for evaluation. Advantage of this method compared to other methods is that, of all climatic parameters, eg temperature, humidity, wind, radiation and sunshine hours, the temperature of the human body are controlled simultaneously used. Using this index, it is the best area to stay and residence of people who are sensitive to weather and climate -related illness and suffering revealed (Kaviani, 1993) (Terjung, 1968).

Table 4
Variables used in determining the level of comfort night and day.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Variable / Month
22.46	25.34	33.44	43.52	51.08	59	46.22	60.44	51.98	42.44	32.54	26.06	Minimum Temperature (F)
48.56	54.5	62.24	74.3	84.02	95	99.32	97.7	90.5	77.54	63.32	52.7	Maximum Temperature (F)
38	29	25	21	18	14	14	14	15	22	31	39	Minimum humidity
83	76	71	62	54	40	37	38	43	57	72	81	The maximum humidity

8. Daily comfort

Terjung method to determine the comfort factor of the day, in different months of the year, this practice is, on the average maximum daily temperature in degrees Fahrenheit comfort factor, and the average daily minimum relative humidity percentage, should be used. Table 5 shows these cases as well.

Table 5
Daily comfort levels in different seasons in the Tirjerd village.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Variable / Month
Very cool	Very cool	Cooling	Pleasant	warm	Hot	Hot	Hot	warm	Pleasant	Cooling	Very cool	daily comfort

According to Table 5, it is observed that, in Tirjerd village, just two months of April and October, there are daily comfort, and in the months of May, June, July, August and September, and hot air was and conditions is available, and in the months of November, December, January, and February and March are also available in cool conditions. Given this, should be pointed out that, to create favorable conditions for housing residents in this area must assure, to the warm season, provide comfort, and the materials used, and construction practices so in the winter, to reduce the effects of cold, such measures should be considered, such as the use of materials with high heat capacity, which prevent excessive cooling in the winter, and in summer warming over the throughout the day to prevent, or build upon creating a funnel, or create rooms in the four sides of the house, they can be used in different seasons.

9. Nightly comfortable

According to Terjung index coefficient, comfortable night, the mean minimum daily temperature, in degrees Fahrenheit, and the average daily maximum relative humidity, the percentage is calculated, and Table 6 of the comfort zone, respectively.

Table 6
nightly comfort level in different seasons in the Tirjerd village.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Variable Month
Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	Very cool	nightly comfort

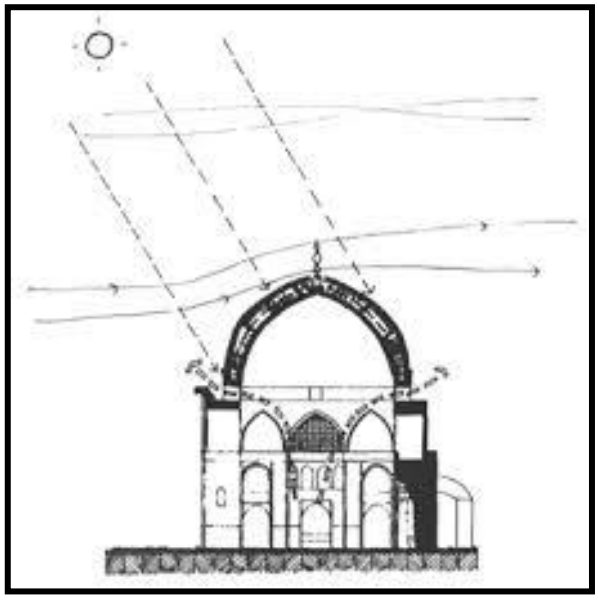
According to the table, which, at Tirjerd village, the rest of the night, without any seasonal conditions, and the temperature is always changing from cold to cool, and thus should be building homes in the housing and architecture, both in terms of construction and materials, the strategy is thought to be too cold during the night the house was avoided, and provide comfort for the residents, and the other hand, the method to properly, the wasting and the exorbitant cost, is prevented.

10. Tissue compared Tirjerd residential village, with its prevailing climatic conditions

According to what was studied, it was observed that the temperature Tirjerd village, varies in different seasons, and even between the maximum and minimum temperatures are also very different, and very hot during the day and at night, especially in winter, be cool, and it must be said that the material or tissue, amend these conditions, therefore the Tirjerd village took the survey, it was found that the material in the context of the rural housing is used, mud, because the essence of soil, straw and water, which comes in the form of thatch, it is summer and hot desert, to adjust. Rural villages and

homes, much focus has been the influence of heat, wind and cold into houses and ten, as far as possible be prevented, and also observed that, in the district during the summer, temperatures have been very high, and the entire body building rural villages, to deal with climate issues, compact and full shade is shaped to prevent intrusion into the sun and see around the house with walls long, to deal with the sun, and since wind is most severe seasons, the walls are built, and it was the best way to create dwellings, dwellings facing south, because the wind often blows from the West, most houses in rural villages to the south.

However, most homes will form dome housing, the housing having a short and tall ceilings are curved, and on some of these domes, Badgyrhay beautifully made. Due to this, the property is a dome housing, house warming over the summer, and during the day because of the shady side, it can prevent, as well as the cold season even at night, the cooling of the house will prevent this kind of housing as well, just based on the prevailing climatic conditions of the region, is formed.



As were investigated, for the comfort of night and day, in different seasons, and even during the day, measures must be in the context of the rural housing district was considered, the study was conducted, it was observed that, the main feature of the village houses, the walls were warm shading, and made all

four sides of the building, a large pond in the middle of the house, the weather moderated, and the courtyard and broad space game called Hall, where most mornings and the summer afternoon, when the sun's radiation is reduced, are used, and therefore, the rest of the night and day, and even in different seasons, we see that the houses in this district rooms are often built on the four sides of the cardinal directions, the rooms facing south in the summer, and in winter the rooms facing north, living in the southern room, stuck in the shadow of the hot season, and the warming too, avoids, and northern room, in winter, sun visor, and providing favorable conditions. So in general, we can say that, Tirjerd village houses, construction materials made of mud and a dome- intensive, with high walls, doors, windows, over the short and limited and narrow roofed chambers are constructed.

11. Conclusion

According to what was studied, it was observed that the Tirjerd village rurals, limited to one side of the mountain, and on the other are restricted to desert conditions, and these conditions of extreme temperature fluctuations for these villages has provided. On the other hand, in the villages, in most cases, the wind is blowing from the west, and the wind is fierce, and the rest of the night in the village, did not provide any fish, and the other terms of daily comfort only in the month of October and April, are available. Tirjerd context of village houses, reflecting the fact that the use of local materials such as mud, the walls being wide, high walls, in the middle of the pool house, directions, four -sided room, and more, all for overcome the extreme conditions of temperature, providing comfort conditions is night and day. On the other hand, north-south orientation of the house, because overcoming the prevailing wind, the west is east. So in general, we can say that, Tirjerd housing village, just based on the prevailing climatic conditions, and formed, and the lowest energy, and sustainable development objectives, in addition to, and past Due to his many years of experience, have achieved this.

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