

## The role of climate in shaping Iranian markets proportions Comparison of Tabriz and Esfahan Bazaar

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**Abstract:** In the past, markets were considered as the main axis of communication and urban space. However, the market as a center of trade and the heart of social life in the city has the same function in different cities of Iran, but it can be seen that in terms of structure, in different climates, there are differences between markets. For example, **market order** in mountainous and cold areas like Tabriz, have brick arches. But the width of **market order** and height of floor to intrados is less than similar markets in hot arid areas such as Esfahan. In this article we aimed to examine the role of climate in shaping Iranian markets proportions including arch height, **market orders** length, walls thickness and other physical characteristics of the traditional markets. Secondary objective of this paper is to study the effect of climate on Iranian traditional buildings and the use of results in the designs on future. This article has been written to comparison of Tabriz and Esfahan traditional Bazaar. The results suggest that: skeleton of Iranian bazaars has made on the main traffic road due to the climate and conditions of region. The Climatic, political, economic, security and cultural factors has greatest role in shaping these bazaars. Latitude and the sun's energy intake had a significant effect in shaping the form of buildings. In hot arid regions, because of the climatic environment, heat and sunshine are more problematic than winter so, the arches are taller, **market orders** width is greater and the pores over the arches are larger.

[Amin Shahamipour. **The role of climate in shaping Iranian markets proportions Comparison of Tabriz and Esfahan Bazaar.** *Life Sci J* 2013;10(5s):633-637] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 110

**Keywords:** bazaar, climate, architectural proportions, Physical Characteristics, Iranian Architecture.

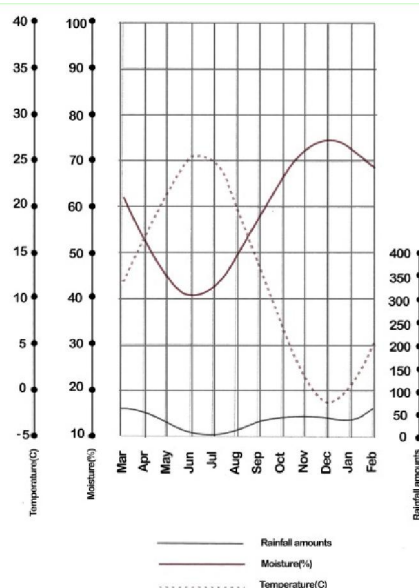
### Introduction

General argument that applies in respect of all traditional structures is their conformance with climatic factors. Urban texture, building form, heights, wall thickness and type of materials, etc in each climatic zones of Iran are in harmony with Iran's climate. Factors such as sun angle, latitude, flow intensity and direction of seasonal winds, water and humidity, affect the climate of a region (p2. Climatic analysis of the Traditional Iranian buildings). In many parts of the world climate is determined by latitude and altitude. Iran being between the orbits 25 and 40 degrees North latitude is located in the hot arid zone. Iran is a high plateau that total areas in which the height above sea level is less than 475 meters are a very small percentage of the total area of the country. Iranian scientists have done climate divisions in Iran using koppen method that according to the Statistical Yearbook of Iran, four divisions of Iran's climate has been suggested by the doctor Hassan Ganji. He has adopted koppen method with little change and according to the latitude of the country as follows: 1. Temperate and humid climate. 2. Cold and mountainous climate. 3. Hot arid climate. 4. Hot and humid climate. Because our study is on the Tabriz and Esfahan cities and Tabriz is in cold and mountainous region and Esfahan is located in hot arid zone, so comparing climate of the two cities is comparing of two climate zones.

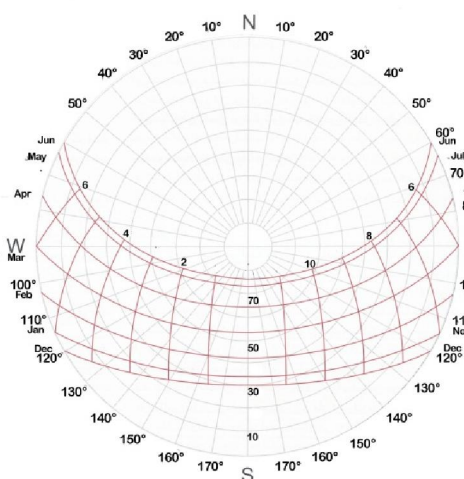
### Materials and Methods

#### Tabriz climate

Tabriz has located in northwestern Iran and the latitude is 38 degrees North and longitude 46 degrees north. Altitude is 1349 m. According to Table 1-1 average rainfall is 321.5 mm and the average number of frost days 108.2 days. Position and angles of the sun in Tabriz are as follows (Table 1-2).



**Fig. 1-1.** Climatic characteristics of Tabriz

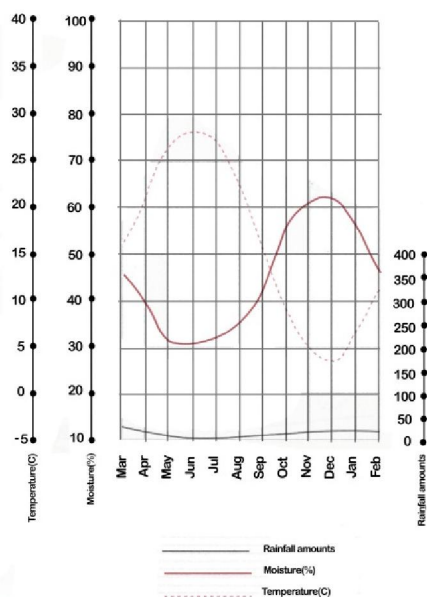


**Fig. 1-2.** Position and angle of the sun at 38 degrees north latitude

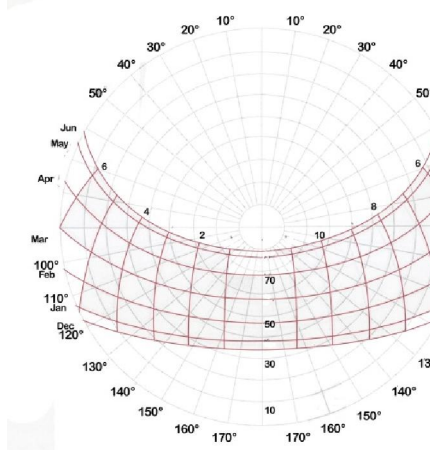
As you can see, in summer, angle of the sun is almost vertical and in winter makes an angle of approximately 40 degrees with the horizon. This shows that using shade on the south side, we can make the best use of the sun.

#### Esfahan climate

Esfahan in central Iran is located in the latitude of 32 degrees North and 51 degrees North. According to table 1-3 average rainfall is 119.5 mm, and the average number of frost days is 80.3 days. Position and angle of the sun in Esfahan is as follows (Table 1-4).

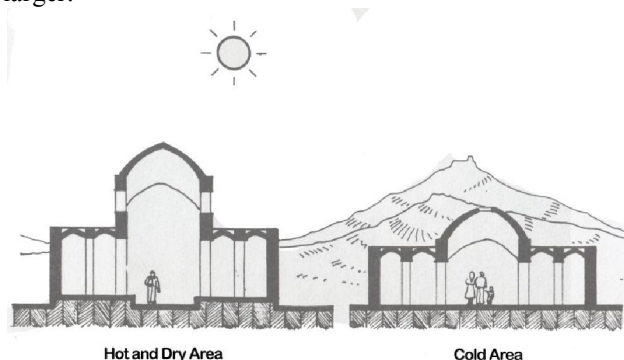


**Fig. 1-3.** Climatic characteristics of Esfahan



**Fig. 1-4.** Position and angle of the sun at 33 degrees north latitude

Comparing climates of Tabriz and Esfahan, we can conclude that latitude of Tabriz is more than Esfahan and solar energy in Tabriz is less than Esfahan. This can be involved in shaping the form of traditional buildings. In cold and mountainous climates, cold and sleet are important factors in determining the shape of the traditional buildings of the area. So the **market orders generally** have brick arches but the **market orders** width and floor to ceiling height is less than similar bazaars in the hot arid regions. The arch prevents more heat exchange between the inside and the outside of **market order** and relatively small size of the width and height of the **market order** causes the temperature in **market order** being in comfort level and acceptable for human. (Pp22- an attempt document traditional market in Iran). In hot and dry regions because the climatic environment heat and sunshine are more problematic than the winter so the arches are taller, the width of **market order** is larger and the pores over the arches are larger.



**Fig. 1-1.** Schematic cross section of the two types of markets in two different climates

### Shaping Markets

Market has arisen because exchange of goods and people's needs. (Iranian markets -Esfandiar Biglari- Page 8). When man, following the development of agricultural production methods and crafts, could produce more than they need, they decided to exchange the product with other products; it was time that the need to trade in human societies formed and a location and space for storage and exchange occurred. In the past, in villages and cities and towns, the market was not constant in one place and in certain sections and certain days were created. With the development of society and exchanges, evolutionary developments occurred in markets location and shape and gradually changed from temporary to permanent and from lack of shelter and architecture to architectural structures. This evolution

gave the concept of location to the market space (Page 13- an attempt document traditional market in iran).

### Physical evolution

It can be assumed that in each settlement there was a main traffic road that was the main crossing site where trade was conducted. Gradually, commercial spaces, and then the productions was formed on the side. This Process, with the protection of property and customers to prevent pathways destroy due to natural causes, leads to development of shelter for this track and covering all over and finally the formation of market orders. And on the other hand the market space was constantly changing shape to meet new needs and, in addition to extending back along the **market orders** will also influence the sections.

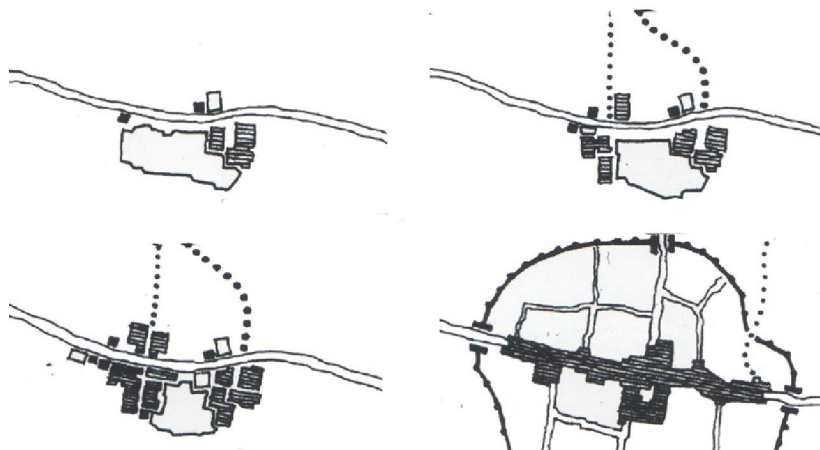


Figure 2-1. Physical Evolution in cities by bazaar



Figure 2-2. Roofed market order

### Tabriz Bazaar formation

Tabriz Bazaar antiquity, like most historical cities of Iran, back to the early period of Islam in urbanization in Iranian post-Islamic. The Jaame mosque has a direct link with the Bazaar and probably the basic core of the bazaars was around the area that today is known as the "Safii Bazaar". Tabriz Bazaar had many recession and boom periods and has been destroyed several times by earthquakes. What remains today is a relic from the bazaar during the Qajar. Tabriz Bazaar is based on one of the city's major routes. The path that connects the southeast gate to the north-west gate of the city.

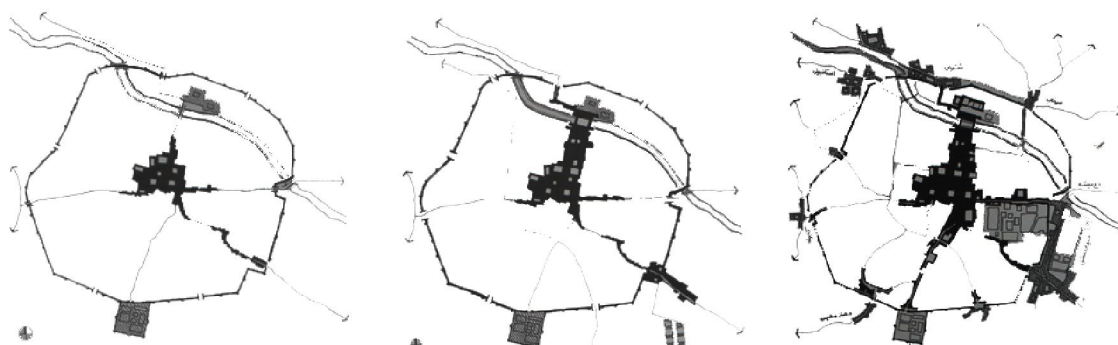


Figure 2-3 Evolution of Tabriz Bazaar

### Esfahan Bazaar formation

In all periods of history, Esfahan has been one of the major and famous cities of Iran. The city at the crossroads of major routes that was of particular importance during the Achaemenid. Basic core of the city were two small settlements "Jey and Yahudieh" that respectively were beside communication and trade routes of the region. One of the key elements of the city was the marketplace (Bazaarghah or Sough square) that was located against Khour gate in the north of city. In the Safavid era, great changes occurred in the city by choosing Esfahan as capital. Shah Abbas Safavi, by making Naghshe Jahan Square in the southern part of the city, gave double boom to the city bazaar and business and led to more business.

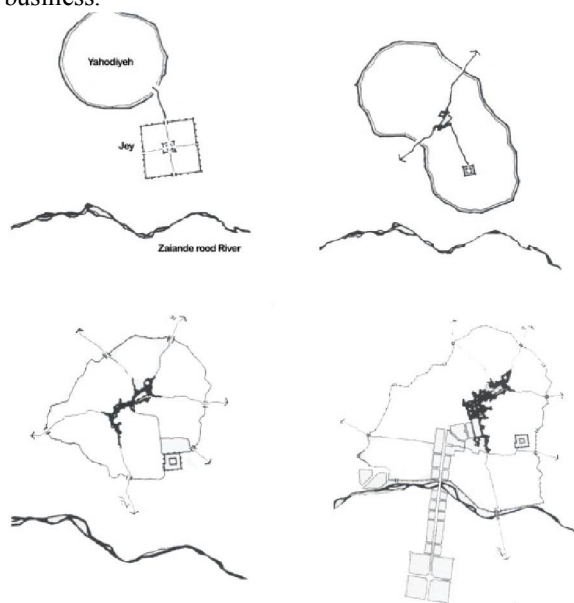


Figure 2-4. The evolution of Esfahan Bazaar

What we can find out from comparison of Tabriz and Esfahan Bazaars is that both have occurred beside a river and cultural center like a mosque. Political, economic, security and cultural factors had the most influence in shaping these two

bazaars. The main difference is in terms of earthquake that Tabriz

Bazaar has been destroyed several times by earthquakes but Esfahan Bazaar had been stable.

### Conclusions

With understanding the contents above, and the author findings, the following results obtained.

1- Comparison of traditional buildings in both Cold Mountain and hot arid regions indicates that every traditional building that has occurred in this area has been pursuant to climatic factors such as moisture, sunlight and solar energy, the prevailing winds, etc. Each individual climatic element is involved in the formation of buildings and spaces. For example, moving the prevailing winds has lead to the formation of the arch form and the air flow, like a stream flowing below the airplane wings, under the arches. The proportions of the arches have changed according to the moisture, the comfort and stability of the buildings so that in hot arid regions, because of the moisture and surrounded position, arch height was more than arch height in cold and mountainous regions.

2- Sun is one of the climatic factors. Best use of the sun can be seen in the northern and southern fronts of caravanserais. In winter that the sun shining with the lower angle, north buildings of caravanserais have maximum use of the sun and in the summer due to warm weather south buildings caravanserais have maximum efficiency. This has led to Esfahan caravanserais arise with square forms and in Tabriz with rectangular forms.

3- To better understand the concept of space in new buildings we should use traditional studies so that with an understanding of proportions obtained in two climates new commercial buildings can arise in line with the climate.

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3/21/2013