Islamic Art

Investigating the Principles of Indigenous Housing Architecture of Hot and Dry Climate of Iran with the Formal Impact Approach of the Building in Promoting Thermal Comfort of Building Users

Abstract

The study of architectural principles in various regions indicates the close relationship between the common architecture in each region and its geographical environment. Scrutinizing the characteristics of architectural styles in different regions and their merits can be effective in providing optimal architectural patterns. Indigenous housing in the hot and dry climate of Iran has constantly provided thermal comfort for its residents; followed by the coordination of the principles of construction according to climatic conditions, environmental comfort and energy saving solutions. Hence, such features can be used in contemporary architecture as rich patterns of former architecture. The issue raised here is the capacity of indigenous architecture used in modern architecture. This research is completed by a descriptive and analytical method with an applied purpose and the use of qualitative and quantitative inference method along with field analysis of native houses of Yazd city; moreover, data collection is accomplished with the aid of library studies and field observation. Findings show that in many cases, indigenous housing patterns of hot and dry climates have a noteworthy outcome on cultivating the thermal comfort of building users.

Research aims:

1. Recognition of indigenous housing design strategies in hot and dry areas.

2. Investigation the influence of the form of the building in hot and dry areas on the issue of thermal comfort.

Research questions:

1. What is the effect of indigenous architectural principles of hot and dry areas on the thermal comfort of the building?

2. Can the indigenous architecture of hot and dry areas be used as a suitable model in modern architecture?

Keywords: architectural principles, indigenous housing, hot and dry climate, thermal comfort of the building.

Introduction

Indigenous Iranian architecture has unique features that, while paying attention to the environment, also meet the climatic needs of each region, which can be seen in hot and dry climates. The characteristics of indigenous housing can be observed in the form of physical, climatic and cultural characteristics in each region. The physical factors of indigenous architecture include all architectural elements that are affected by their underlying climate. Indigenous housing is physically influenced by climate and culturally influenced by the nationality, religion and customs of its users. In this regard, it is possible to improve the architecture of today's buildings by recognizing and examining the principles of indigenous architecture and features that are compatible with the climate. Therefore, in this article, the principles and characteristics of indigenous housing in the architecture of the past in the hot and dry climates of Iran and achieving the factors affecting the desired thermal comfort in relation to the principles of the building to improve the quality of the environment and reduce energy use is studied. In this research, first, the principles of indigenous housing design of hot and dry climate are examined and then, according to the studies and qualitative study of the architectural features of this climate, effective factors in thermal comfort are inferred through the principles of indigenous architecture. The purpose of this study is to achieve the physical factors affecting the thermal comfort of people in relation to the shape of housing in the hot and dry climate of Iran by exploring the rich architecture of the past in physical and climatic dimensions and to achieve models that can revive the native architecture of the past and recognize principles that meet the needs of contemporary housing in relation to the thermal behavior of the building. The research hypothesis is based on the opinion that the doctrines of indigenous housing design criteria are effective in the thermal comfort of space users. In this regard, the main question of this research is: how the principles and characteristics of indigenous housing in hot and dry climates can improve the thermal comfort of building users be effective? Research findings can lead to the presentation of solutions to revive the architecture of the past in contemporary housing in relation to climate and environmental conditions and improve the quality of design in contemporary housing architecture.

Regarding the background of the present study, it should be said that special climatic features and the resulting thermal relief and comfort in the traditional houses of each region have always been considered by researchers and architects. Shaterian (2009) analyzes the texture characteristics of hot and dry climates. Tavassoli (1361) has also studied the characteristics of buildings in this climate. According to Rapaport, interaction and balance with nature instead of dominating it, is the factor of superiority of indigenous architecture over modern architectural styles (Rapaport, 2009: 121). The book Principles of Climatic Design of Traditional Iranian Buildings, which is one of the first specialized books in this field, has tried to formulate and introduce traditional methods of local adaptation in detail (Ghobadian, 2005: 35). In studies conducted by Tavassoli, the climate of hot and dry cities and the construction of hot and dry cities in Iran, in which in addition by expressing more cultural and historical factors to the role of climate and how the inhabitants of hot and dry cities have been able to survive in harsh environments and how they built air conditioners and dealt with harsh environmental conditions for centuries is studied (Tavassoli, 135: 32). Asgarinejad (2005) has studied climate-friendly architecture and introduced very cheap and practical methods to take advantage of environmental conditions to provide comfort in the living space and has considered the effects of climate-friendly architecture in traditional Iranian buildings (Asgari, 67: 2005). In his book entitled "Climate and Architecture", Kasmaei explains the appropriate architectural conditions for buildings and determines the shape of the building in accordance with the climate of each place (Kasmaei, 2003). Mohammadi in his book "Applied Meteorology" has studied the relationship between climate and architecture and has expressed the form of architecture and buildings in different parts of Iran according to climatic conditions (Saliqeh, 69: 2005).

This article has been done with a practical purpose and by the method of qualitative and quantitative analysis and inference and analysis of native housing documents in Yazd and the research results are obtained by descriptive methods and logical reasoning. In the process of conducting the research, the tools of library studies, observation, and field survey have been used, so that first, by referring to the documents and sources in the articles related to indigenous housing, items related to the research background have been collected. Study samples have quantitatively examined the desired criteria in the samples through quantitative and with a scoring system, the principles and design criteria in these houses have been studied and finally, from the analysis of the studied criteria, with a quantitative method and with logical reasoning about the findings to express the results has been emphasized on.

Conclusion

Findings reflect the effect of the principles and characteristics of indigenous housing in hot and dry climates in adapting to the thermal comfort of building users. The results of this research can be used for housing designers in relation to issues related to indigenous architectural criteria and its adaptation to contemporary housing design; physical criteria for indigenous housing in Iran's hot and dry climate, which are related to the shape and function of ports in relation to the thermal behavior of the building, include introversion and the presence of a central courtyard, correct use of materials in construction and special construction methods. Higher, preventing the exchange of energy between indoor and outdoor space, using renewable energy in heating and cooling indoor spaces, creating a sense of peace and security, bringing humans closer to nature, zero pollution and zero fossil energy consumption in material production, reducing transportation and energy shifts on unnecessary and prevent the occurrence of greenhouse phenomena in indoor spaces have paid attention to creating stability in the building. Now, according to the studies, it can be said that the hypothesis has been proven and the principles and characteristics of indigenous housing in hot and dry climates are effective in the thermal comfort of the building. Creating a connection with the architecture of the past will be useful and effective in responding to the environment and creating sustainable housing, and will revive the architecture of indigenous housing in contemporary architecture and bring comfort to the users of the building.

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