

Components of Biophilic Design on Achieving Viability with Emphasis on Islamic Architecture

Abstract

Mankind desires to connect with the natural world is an innate need. Nature and the transfer of its concepts in the design of living environments will increase the quality of life and improve the livability of the place. Traditional architecture of Iranian cities has long been significant and climate factor has been considered as a superior parameter in design. Given that most modern architectural ideas are Western, the issue here is how to adapt the principles of biophilia to the principles of architecture in hot and dry climates. The present research has been accomplished in terms of applied purpose and descriptive-analytical method with a qualitative and quantitative approach. Documentary methods (to explain the indicators) and survey (observation and questionnaire) were used to collect data. Since the present study is a quantitative research, a questionnaire was used to collect data and SPSS statistical software was applied to analyze data. Correlation tests were applied to examine the relationships between variables. A one-sample t-test was used to compare the statistical population with theoretical median and multivariate regression to investigate the effect of biophilic design components on bioavailability; moreover, the new city of Hashtgerd was selected as the study area. Findings indicate that there is a direct and significant correlation between biophilic design variables and computable bioavailability. On the other hand, based on a single-sample t-test, it was found that the viability status is lower than normal (average 3), consequently, the community is not in the desired condition. Based on the multivariate regression test, the equations of how the relationships between the variables were presented and based on the beta coefficient of prioritization of biophilic design variables on the viability of the site, it was announced that the "biomorphic" component has the greatest impact on location viability. There are also a number of components of Islamic architecture such as the use of light and space, spatial relationships and the shape and nature of natural space in biophilic design.

Research aims:

1. Investigating the viability of biophilic architecture with location.
2. Examining the degree of compatibility of biophilic architecture with Islamic architecture.

Research questions:

1. To what extent is biophilic architecture viable and adaptable to place?
2. What are the similarities between biophilic architecture and Islamic architecture?

Keywords: Biophilic design, hot and dry climate, Islamic architecture, viability.

Introduction

Analysis and study of the general behavior of society in the current era, indicates cultural inadequacies and lack of appropriate social behaviors due to psychological problems and current turmoil in society. In this regard, in order to reduce and modify these inadequacies and improve the quality of life, it is important to pay attention to public areas in cities. Humans develop throughout their lives, and human mental maturity is affected not only by emotional relationships with other people, but also by the myriad of physical environments around them. That is why human communication with the environment can be very imperative since a significant part of our environment is man-made environment, the relationship between man and the environment and especially the scientific mechanisms of this relationship and the ability to translate it into the language of architecture and environmental design, has always been one of the concerns of designers in regard to research in scientific fields related to architecture and environmental design. With the advancement of human knowledge and quality of life in the twentieth century, on the one hand, designers have sought to use the broader context of the humanities in environmental studies and its application in design, and on the other hand, humanities researchers, especially psychologists, transfer and organize laboratory studies in the context of everyday and real human life. Nowadays, a new approach called viability has been proposed to bring the fields of artificial and man-made fields closer to nature, in which traces of nature, looking to the past, preserving identity, etc. can be seen. However, the proposed approach is based on the social, cultural and climatic criteria of Western countries. The question now is what will be the principles and characteristics of Iranian cities to achieve a habitat model.

On the other hand, new literature called biophilic design is common among architects, planners and urban designers today. The latter idea believes in the use and preservation of nature and natural elements (diversity of plant and animal species together) at the scale of region, city, neighborhood and even building. On the other hand, not only the relationship between humans and environmental issues (humans and plants - humans and animals) is also important, but also the relationship between people and social interactions in urban environments is of great importance. On the other hand, the traditional architecture of Iranian cities has long been important and the climate factor has been considered as a special parameter in design. As cities with hot and dry climates are architecturally stable cities in the world. Considering that most of the ideas are Western, so the main purpose of this study is to adapt the principles of biophilia to design principles in hot and dry climates, followed by the components affecting the creation of livable space based on the idea of biophilia in accordance with local design principles a warm and dry climate will be provided.

Regarding the subject of the present study, no independent work has been written so far. However, articles have been written on the subject of biophilic architecture. An article entitled "Why use intelligent biophilic design of creation in biophilic architecture" has been written by Faqih Abdollahi and Eslami Moghadam (2016) in which they have studied the place of nature in architecture. It has not been related to Islamic architecture. Another article entitled "Study of the effect of using the principles of biophilic architecture on the dimensions of existence in the design of the building" has been written by Zahra Kalantari (1396). In this article, the author writes about the benefits of biophilic architecture on their spiritual and personality development. With these interpretations, the present study has tried to study the design of biophilic architecture with Islamic architecture with a different approach.

The present research is "descriptive-analytical" in terms of applied purpose and method of doing it. Documentary methods (to explain the indicators) and survey (observation and questionnaire) were used to collect data. Therefore, the data collection tool is a researcher-made questionnaire. The statistical population of the study includes residents and users living in the new city of Hashtgerd. Cochran's formula

was used to determine the sample size with 95% confidence level and 0.01 estimation accuracy. The sample size was 382 people. The sampling method is simple and accessible random method. The reliability level of the research questionnaire was obtained using Cronbach's alpha method for each of the components and references. According to the existing assumptions, if the Cronbach's alpha coefficient is 0.7 or more, it has a good reliability. If the Cronbach's alpha coefficient is between 0.5 and 0.7, the validity of the questions is evaluated as average and the coefficient is less than 0.5 lacks reliability. SPSS statistical software was used to analyze the data. In order to analyze the obtained data, inferential statistics (Spearman correlation test and multivariate regression) were performed. As mentioned, the chosen approach in this study has been quantitative. Therefore, first, in the library studies section, a theoretical framework is developed by reviewing the researches related to biodegradability and biophilic design and the characteristics of hot and dry climate, as well as studying the theoretical foundations and theories of experts. The study population, the new city of Hashtgerd, which was located and planned in the late 1990s in the north of Tehran-Qazvin highway, was gradually formed in the 1990s with the construction of several preparation projects (phase one, two and then three more phases). According to the census of the Statistics Center of Iran, the population of the new city of Hashtgerd in 2016 was equal to 42,147 people.

Conclusion

As mentioned, the components of biophilic design in accordance with the conditions of hot and dry climate are: culture and society, biomorphism and education and knowledge. For a meaningful study between the mentioned components, as mentioned, Spearman correlation method is used. Given that the numbers obtained are between zero and one, so there is a significant relationship between the components of biodegradability and biophilic. As in the data analysis section, correlation, T-test and multivariate regression were used. With these interpretations, it should be concluded that there is a significant relationship between the components of viability and biophilic design, which are: vitality and biomorphism (0.613), identity and education and awareness (0.712), participation and culture-community (0.412). On the other hand, there is a significant relationship between the components of vitality and identity and participation and biomorphism, education and culture. Biophilic design is for assessing biomorphic viability, education, culture and community. On the other hand, the criteria of viability are vitality, identity and participation. The results of multivariate regression test indicate that the effect of education, biomorphism and culture on the viability of a livable place is 24%, 21.1% and 14.7%, respectively. The impact of education, biomorphism and culture on the achievement of participation in the creation of livable place had a positive effect of 12.6%, 5.4% and 10.5%, respectively. On the other hand, the effect of education, biomorph and culture variables on identity to create a livable space is 29.6%, 28% and 1.8%, respectively. Finally, the effect of biophilic design variables on viability is given in Table 13. Finally, Figure 4 shows the prioritization of biophilic design variables on site viability according to the impact factor obtained from multivariate regression test. Comparison and analysis of the basic components in Islamic architecture in the field of use of light, water, open space and attention to nature indicate the compatibility of biophilic architecture with Islamic architecture.

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