

## **Green Architecture: Harmony and Compatibility with the Environment (Case Example: Rasht City)**

### **Abstract**

Green architecture is one of the new trends and approaches of architecture which has attracted the attention of many designers, managers, urban planners and designers in the field of construction in recent years. This architecture, which originates from the concepts of sustainable development, seeks to create compatibility and harmony with the environment. The current research is an applied study with a descriptive-analytical nature; moreover, according to the method of implementation, the paper has a survey framework. The statistical population are the citizens of Rasht city selected using random sampling method and Cochran's formula; as a result, 384 citizens were selected as a sample. Finally, SPSS software, one-sample t-test and Excel software were used to analyze the data, then using the sustainability barometer model, the sustainability of the green architecture of Rasht city was measured from the citizens' point of view. The components of the research include energy conservation, working with the climate, reducing the use of new resources, respecting the site and respecting the users. The results show that the sustainability of green architecture is moderate (0.48); this shows the unfavorable situation in all components of green architecture in the city of Rasht. Nevertheless the point to consider in this weak stability (0.396) is the energy conservation component compared to other components; This is due to the lack of change and culture in the field of using new energies. The highest level of stability (0.536) is related to the component of respect for users. Citizens' willingness to develop urban green space is also evaluated as average. The desire to keep flowers and ornamental plants in residential space has the highest average (4.04) and participation in educational and cultural classes related to green architecture has the lowest average (2.89).

### **Research aims:**

1. Examining the components of green architecture.

۲. Evaluation of the realization of criteria and principles of green architecture from the perspective of citizens as the main actors of Rasht city.

### **Research questions:**

۱. What are the benefits and components of green architecture?

۲. How are the criteria and principles of green architecture apprehended from the perspective of Rasht citizens as the main factors of the city?

**Keywords:** green architecture, citizens, sustainability, Rasht city, barometer model.

## **Introduction**

Cities are considered the most obvious environment of human life and it is predicted that by ۲۰۵۰, about ۶۸% of people on the planet will live in cities (United Nations Iran, ۲۰۱۹). However, cities, as environments that should be the basis of good quality for human life, have problems in meeting the needs of their residents and positively influencing their quality of life (Yaghfoury et al., ۲۰۱۹). The relationship between urban planning and management and community health is not a new issue; rather, what has changed now is the severity of the health crisis in both developed and developing societies (Northedge et al., ۲۰۰۳, ۵۵۶). In ۱۹۹۴, in the second environment and health conference held in Helsinki, for the first time, the importance of city health and prioritizing it over other issues was discussed. In this conference, it was stated that many matters related to the health of cities should be left to local officials, until then almost most of the decisions were made in the central government (Lawrence and Fodige, ۲۰۰۹, ۱۵). Therefore, after that, it was considered stable in the field of cities. In the past two decades, architects sought to formulate methods and principles to achieve environmental sustainability, which have been introduced under different names, such as sustainable design, sustainability in architecture, and green architecture (Hall, ۲۰۰۰, ۲۳). Today, with the progress of science and technology, architecture is aligned with science and technology and is moving forward in the direction of sustainability. The use of technology in sustainable architecture is considered a necessary and important need today. Due to the increase in air pollution and environmental problems and the increase in fossil energy consumption and costs, in this regard, technology can be effective in creating sustainable architecture and reduce

energy and environmental pollution and cause beautification and improve the design of buildings. In fact, technology helps to create sustainable architecture and advances it in the direction of improvement (Beizawi and Shahriari, ۲۰۱۸). In green architecture, the building, as a part of the structure of the surrounding environment and its neighboring nature, not only does not waste energy, but also does not cause environmental pollution and has no negative effect on human health and is economical including optimum climate and energy consumption, having materials compatible with the climate and being in the ecological cycle and moves towards the realization of the goals of sustainable development (Darban and Javadnia, ۲۰۱۸, ۱).

The most original and stunning examples of architecture are houses that are formed in relation to local weather conditions, native materials, and construction methods of each region. The architectural product of the past, along with harmony with environmental conditions, seeks to preserve the comfort of users and express the identity of the society (Ahmed Eli, ۲۰۱۱, ۵۱۱). Meanwhile, the northern regions of the country, especially the city of Rasht, in the not-so-distant past, were a clear example of reinterpreting the characteristics of green architecture using native architecture in the country. The physical texture of this city has changed over time and has been mixed with new technologies and in turn, has largely overshadowed the local architecture of the region. In the city of Rasht, in recent years, facades have become common that are not compatible with the climate of the region, nor with the architecture and appearance of the cities; structures with all-glass facades, structures with all-composite facades, structures with domed roofs, porcelain roofs and other instances show the lack of appropriate standards in this regard and most importantly, the lack of a suitable model in this regard. Unfortunately, some architects and designers also impose modern and non-native patterns on the builders, which can be a sign of their lack of knowledge about the characteristics of materials compatible with the region's climate and the importance of urban texture and landscape. In this regard, the aim of the present study is to evaluate the realization of green architecture in Rasht city, from the perspective of citizens.

Among the pioneers of the sustainable architecture movement in the ۱۹۹۰s are John Ruskin, William Morris and Richard Letabi. The purpose of designing sustainable buildings are to reduce its damage on the environment in terms of energy and use of natural resources. If in modern architecture form is a function of function, in climatic architecture form is a function of climate. Therefore, since the ۱۹۹۰s, climate architecture has mainly been proposed under the title of

sustainable architecture. According to Encyclopedia Britannica, the concept of green architecture dates back to the rise of environmental awareness in the 1960s, as a movement of socially active youth who questioned similar urban suburbs and sprawling cities. The first real experience of green architecture in the country is the green residential buildings of Kosar, in the city of Mashhad, where clean energy has been used in all levels of the building's architecture. The necessity of using this architecture as a duty to build buildings in our country is becoming more and more obvious day by day (Dashti Shafiei, ۲۰۱۲). Among the accepted studies related to the research topic, the following can be mentioned:

In a research, Iman Abdulshahid (۲۰۱۷) investigated the challenges of green architecture in the Middle East in different rating systems. Raqib et al. (۲۰۱۶), in a research entitled "Green architecture: a concept of sustainability" seeks to highlight the problems and complex issues of sustainability in the field of architecture, which includes many aspects of human life. Mahdavi-Nejad et al. (۲۰۱۴), in a research, investigated the issue of green architecture and false green architecture based on LEED norms in developing countries in the Middle East region. Chunga et al. (۲۰۱۲), in a research, investigated the development of new technologies for the use of wind, solar and rainwater renewable energies for high-rise urban applications. Wang et al. (۲۰۱۱), in a study, investigated the beauty of the green architecture of the Expo and sustainable development, emphasizing the Chinese pavilion (a type of traditional architecture) as an example. Moslami et al., (۲۰۱۸) in their paper "New and Renewable Energies in Sustainable and Green Architecture with Passive Design Method" focus on this issue; moreover, Rahimi et al. (۲۰۱۸), in their research entitled "The Role and Performance of Green Roofs in the Field of Energy Conservation with a Sustainable Architecture Approach" also analyze the issue. Other papers in this regard include: Bahrami and Sabet, (۲۰۱۸): "Green Building, a New Look in Line with Sustainable Development"; Rezaian Kale Basti, (۲۰۱۷): "Green Architecture, with an Emphasis on Sustainable Urban Development; Hosni et al. (۲۰۱۷): "Sustainable Architecture, A Solution for Moving Towards Sustainable Development"; Javadania and Darban, (۲۰۱۷): "The Title of Green Architecture is a Step Towards Sustainable Architecture"; Hakimian and Lek, (۲۰۱۶): "Green Infrastructure: a Common Concept in the Education of Two Fields of Urban Design and Landscape Architecture"; Bostani and Baghai (۲۰۱۵): "Promoting Green Architecture in order to Achieve Sustainable Urban Development in Contemporary Architecture"; Bekri et al., (۲۰۱۶): "Development of Green Roof and Green Wall in Sustainable Architecture and Urban Landscape;

Rezvani et al., (۲۰۱۶): “Investigating the Role of Green Roofs as a Strategy to Improve the Quality of the Urban Environment from the Perspective of Sustainable Architecture”; Tagvi, (۲۰۱۴): “The Role of Green Roofs and Walls in Sustainable Urban Development (case study: Tehran)”. According to what has been said, the present research aims to analyze the views of citizens of Rasht regarding the effective components in green architecture in a quantitative and qualitative way.

## **Conclusion**

Green Architecture or Sustainable Architecture is one of the new trends and approaches of architecture that has attracted the attention of a large number of designers, managers, urban planners and designers in the field of construction in recent years. This modern architecture, which originates from the concepts of sustainable development, is one of the basic needs of mankind in today's world. The art of architecture in the world has witnessed different methods and styles in terms of the appearance of the building, such as classical, neoclassical, Roman, baroque and other forms each of which had a specific beginning period and manifestation. However, the most modern and innovative style of architecture in this century, which can also be called the century of technological progress, is sustainable and green architecture style. In addition to changing the appearance of the building by changing the construction materials, the structure method, and the resources and energies used, this important issue has been addressed to an inevitable issue in the present age, that is, the adaptation and preservation of the environment and the reduction of environmental destruction.

Green architecture in the countries of the world is more than the attention of building designers; it is of interest to managers and urban planners and urban environmental activists. This important issue has been studied in the country of Iran with many environmental problems, especially in cities, as a new program and goal; nonetheless, unfortunately, there has been no noticeable growth in terms of implementation and action. The city of Rasht, as one of the most populated cities in the country, is not exempt from this problem despite being located in the temperate and rainy region of the north of the country and its architectural style is still far from the standards and principles of green architecture. In the present research, which has evaluated the principles of green architecture in this city, five components of green architecture and one component titled the degree of desire of citizens in the development of urban green space as a facilitator for the growth of green

architecture have been discussed. The research results show the weakness of urban management and unwillingness of citizens to comply with the principles and standards of sustainable architecture in the city. Based on the results of the research, the sustainability of green architecture is moderate (0,48); this indicates the unfavorable situation in all components of green architecture in Rasht city. Then again, the point to consider in this weak stability (0,396) is the energy conservation component compared to other components; This is due to the lack of change and culture in the field of using new energies. The highest level of stability (0,536) belongs to the component of respect for users. Among the subjects of citizens' willingness, "tendency to keep flowers and ornamental plants in the residential space" with an average of (0,48) shows the highest level of citizens' willingness. In other items, except for the item "participation in educational and cultural classes related to green architecture", the average obtained is higher than the average. From the point of view of citizens, the lowest average in the subject of participation in educational and cultural classes are related to the average (0,48). In general, the results of the research in the field of all the components are weak and indicates that green architecture in Rasht city still has a long way to emerge and replace the past style. The reason for this can be attributed to many factors and activists, including weak management, lack of participation of citizens and other features; however, according to the results of the research, the most significant reasons are the lack of knowledge of city managers concerning the new style, absence of planning, lack of management ability to control new constructions, weak infrastructure, deficiency of suitable alternatives in resources and energy consumption, lack of participation and ignorance of citizens, the financial weakness of citizens to change, the implementation weaknesses of urban plans, the stereotyping of studies and the lack of attention to how to implement and its consequences, not enough expertise in the field of implementing a new style and the high cost of change among many other reasons in built textures and places with worn texture.

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