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An Overview of the Relationship between Culture and Energy Sustainability in Traditional Iranian Architecture

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ABSTRACT

Undoubtedly culture is the portray of the most significant ethnic beliefs and one of the best examples can be found in the energy utilization in both quantitative and qualitative dimensions, in addition to meeting biological and cultural needs of man, the body of a building, as part of the environment supplies the energy required by the building through natural resources, this trend results in architecture in harmony with climatic and vernacular cultural and climate that can be a good response to the sharp reduction in renewable energy sources and increasing environmental pollution resulted from the imitation of the World architecture without appropriate understanding and in compliance with aboriginal principles of culture and climate in contemporary age of Iran, lack of considering the geography and the climate that are important elements constituting culture and accordingly architectural culture and is one of the most important aspects in the development of vernacular architecture in harmony with the environment. Iran's ancient architecture that always had a special place relied on creativity and sustainable features at the present time has distanced from its reality due to exposure to various phenomena such as colonialism sites and the influx of oil wealth, without having the proper management support as well as loving the newly industrialized Western civilization. However, the ancient Persian architecture, given the abundant evidence of discussion, has been faithful to the principles of sustainability. Iran's ancient buildings are designed so that they are well and simply heated in winter and comfortably cool in summer and this is the simplest and most functional concept of sustainable architectural. At least self-sufficiency and avoidance of idleness are those basics of Iranian architecture that are in consistent with (green) sustainable architecture, undoubtedly and this means that the Persian architecture had created this way long before the world looked for the idea of a new approach to architecture. In this article we have tried to explain the relationship between culture and architecture, to investigate sustainability in the ancient architecture of Iran and the question that the examples of sustainable architecture in ancient Iranian architecture can basically be renewed or not?

Key words: Climate - Sustainable Energy - Culture - Vernacular Architecture - Sustainable Architecture - Traditional Architecture

INTRODUCTION

Discussion on Iranian architecture models should be more considered nowadays, these models, although in some cases may be coupled with some short comings, in most cases are still useful and reliable, the ancient Iranian architects have designed so wisely and creatively that one still can learn from them and their works.

With the development of new technologies in contemporary age, cultural standards have undergone dramatic changes and many local and regional cultures are going to be ruined by global culture which is the product of the industrial revolution, and consequently respecting the principals of climate designing buildings which is part of the valuable indigenous culture of every region and is the result of a long conflict between culture and environment is being forgotten.

Many studies have been carried out on the impact of culture on architecture or climate design in traditional architecture but there is much fewer studies on the relationship between culture and sustainable energy in architecture and dramatic power of culture in explaining the optimized method of energy exploitation in building and especially renewable energies.

SUSTAINABLE DEVELOPMENT

Word sustainable is derived from Latin word Subtenant hat means to keep upper or to keep from the base. Every society must be supported by the inhabitants of the present and the future to be able to continue to an uncertain future without crashing due to erosion.

Sustainable Development and Architecture

It is evident that all human activities are done in spaces that are created by the idea of their architects. And because the weaknesses of the space is effective not only on the ecology of the area in which it is located, but also on the ecology of the world, thus these are the architects that undertake a very difficult and important responsibility.

CULTURE IN ARCHITECTURE

"Farhang¹" is a word consisted of two parts: "Far" and "hang". "Far" is a prefix that means up and forward and "hang" means dragging and the heaviness of weight. From the combination of the above parts, meanings of knowledge, learning politeness and education can be inferred. The word is culture in European languages derived from the Latin word (Colure) meaning cultivation, inhabitation, worship and guard. Many definitions have been provided in relation to the concept of culture. It can be said in a general definition of culture that it is a series of phenomena and acquired material (technology) and immaterial (beliefs) abilities that human beings have established to organized meeting of the needs arising from the special social relationship with the natural environment (geographical and climatic factors) and the man-made environment (architecture) and it is transferred from one generation to the next. A very wide range of factors and phenomena affects the formation and the life of a culture, however, this effect is a reciprocal relationship. These factors have been organized into four categories as follows:

- Factors related to the relationship between man and environment (nature, geographical factors, environmental factors, technology, etc.)
- Factors related to the relationship between man and her/himself, other people, and environment (society, science, economics, etc.)
- Factors related to human relations (language, symbols, art, law, etc.)
- Factors related to the relationship between humans and the supernatural (religion, beliefs, views ...)

In the context of sustainable architecture factors related to the relationship between human and environment are the most important, geographical features of the environment especially climate are among factors influencing the cultural characteristics. There is a deep connection between culture and climate. Lifestyle and how to exploit the architecture reflect the cultural and climatic features of a geographical area. Normally the relationship exists but in cases such as migration of ethnic groups the accordance between cultural and architectural models and geographical and climate conditions fades away but over time these are the climatic conditions that succeed to impose many of their principles and model son culture through which they are able to affect the culture indirectly, in addition to their direct impacts and through this a cultural is formed in architecture which is a subset of the cultural context of the society and climate, weather and environmental standards and cultural context.

Sustainable architecture in the past

In the past it was believed that the entire universe has been created from the combination of four elements: water, soil, wind and fire. However, it is now clear that the creation of the world has been a very complex process, but, these four elements still provide appropriate solutions for the insight into the interaction between building and its surroundings.

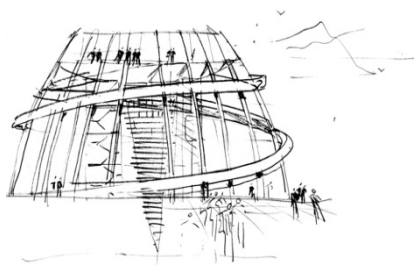


Figure.1 German Reichstag building: German Reichstag building

Buildings that are designed based on sustainable architecture, unlike other buildings are more flexible and somewhat fluid in addition to coordinating with the climate and the environment, according to Richard

¹ The Persian word for "culture"

Rogers' buildings like birds, which are dressed in their winter plumage, adapt to new life conditions upon which adjust their constructions.

The exact definition can be found in buildings belonging to the traditional architecture of Iran. The application of concepts of sustainability in architecture, has introduced new issues in the name of "sustainable architecture" or "ecological architecture" or "green architecture" or "environmental architecture" that all have a common sense.

Principles of Sustainable Architecture

Consumption of fossil fuels as energy source reduces the beauty of nature reduces natural resources rapidly and finally the ecosystem leaves its natural symmetry.

The materials selected for buildings are very important for energy conservation. Green architecture in recent years has been able to achieve considerable success. These include new construction techniques and production of materials suited to the thinking of green architecture.

In an overview, green architecture can be expressed as following principles:

- ✓ Protect natural energy such as wind and water and so on.
- ✓ Keep our environment healthy.
- ✓ Develop economy in our country.
- ✓ Provide high quality of life for our citizens. (Welfare)

Numerous strategies have been presented for sustainable architecture. Scientific papers in international conferences and websites, including:

"The American Institute of Architects Committee on environmental issues"

WWW.aia.org.cote

"Green Building Council of America»

WWW.usgbc.org

"Sustainable homes" In Europe and America,

WWW.sustainable home.co.uk

And many books have also been written.

But for further explaining, only a popular view in this regard will suffice.

The view of "Kelly and Rosana Hart" who also reside in a green building

According to them, some of the principles that must be respected in a building so it can be classified among the green architecture include:

- Small think
- heat with the sun
- Keep your cool
- use renewable energy
- Conserve forests
- use Local Materials
- use natural materials
- save our forests
- Recycle Materials
- Build to last

And so on. These messages, however, are short and simple; represent some forgotten principles that guide to find the answer of the secrets of today's architecture.

At least self-sufficiency and avoidance of idleness are those basics of Iranian architecture that are in consistent with (green) sustainable architecture, undoubtedly and this means that the Persian architecture had created this way long before the world looked for the idea of a new approach to architecture.



Figure 2: house with green roof in Poland



Figure 3: Green House in Austria

The relationship between sustainable architecture and culture:

Behavioral patterns from different cultures in different regions have significant differences. A large part of these behavioral differences are rooted in climate (weather) and geographical conditions (physical characteristics of the environment), such as sleeping and eating patterns, these patterns can bring about major changes in the architecture, for example in residential architecture of the communities in which food preparation takes a long time or mealtime is the time when the family gets together, kitchen is large, it has established a strong connection with the inner space and also visually communicates with the external environment. Culture influenced by climate explains dos and don'ts of the architecture space by behavioral habits, and sustainable architecture specifies the conditions, the quantity and the quality of the do's and don'ts by the principles consistent with geography and climatic, in fact, a large part of the interface between culture and sustainable architecture is accounted for geographic and climate factors. These factors (environment and culture) are intertwined in the body of form of architecture called vernacular architecture so that one cannot delimit.



Figure 4: wind-catcher in Yazd



Figure 5: The pitof of Kashan Mosque garden



Figure 6: Roof textures of Anarak Figure 7: Roof and wind-catcher in Birjand

Explaining the relationship between ancient (traditional) and Vernacular architecture

In a general definition it can be said that vernacular architecture is the architecture of a certain territory shaped according to underlying culture, climate, geography, economy, society. Vernacular architecture is a common response to cultural needs and environmental factors in architecture. Because this style of architecture over the generations have adapted to climate and culture of the community and has selected and evolved best practices to meet the cultural characteristics (non-material needs) and sustainable energy (material needs) in the architecture. The vernacular architecture is actually the place where culture and climate will be found as a single physical entity, and the result is the culture of energy sustainability in architecture, however, it must be noted that vernacular architecture is defined in terms of ecology and geography and does not belong to specific periods of the history of the region, and will continue so long as there is not a cultural rupture in the process. But when cultural ruptures occur and the past habits and traditions of vernacular architecture are undermined and a new culture is replaced, it has lost its continuity and the past vernacular architecture is known as traditional architecture in terms of time, however, vernacular architecture still continues to exist, however with a different form and function derived from the culture of modern architecture, regarding the traditional architecture of Iran it should be said that the change in culture and architectural values began in the late Qajar period by the development of world culture and the introduction of technology and industrial developments and has caused dramatic changes in vernacular architecture of Iran, such as uniformity of residential houses in many areas with different climate, creating comfort by mechanical devices and architectural designs and interior design incompatible with many values of vernacular cultural.

Sustainability culture and foundations of traditional architecture of Iran

In the study of Iranian ancient architecture this truth can be found that the foundations of culture and climate are mixed together so that they cannot be separated. For example, the central courtyard in traditional architectural has well fulfilled the need for privacy in the traditional culture of Iran in terms of the hierarchy between different domains (private, semi-private, public and semi-public) in the form of

creating a private or semi-private space. The space while providing privacy has a climate function and supplies lighting and ventilation, heating and cooling in different seasons, in which identifying the priority of cultural and climate needs is impossible.

Privacy, counterbalance, avoiding waste, contentment, avoiding idleness and vanity, self-sufficiency, human scale, unity, justice, and seeking perfection and so on are some of the important features of traditional Iranian architecture culture, however some of the features can also be found in vernacular architecture around the world due to common cultural roots of human or similar climatic conditions of different regions, in the Iranian architecture, meeting material standards on natural resources energy and appropriate exploitation and non-material standards on the culture of immaterial values and mental and physical characteristics of human are interdependent. The certain architectural culture in the spirit of the Iranian traditional architecture has been rooted in the features of the environmental and the general culture of the society.

CONTEMPORARY CULTURE AND ARCHITECTURE OF IRAN

With the assumption that the Iranian contemporary architecture began at the late Qajar and continues until now, in the late Qajar period because of the trend toward the West culture, the process of profound change in Iranian architectural culture began that many of these changes were not only to meet the cultural (whether traditional or modern), and climate needs but also have they acted in the opposite direction. Non-normative construction and high level of energy consumption and pollution, especially in the housing sector is evidence. Finally, the path of culture and traditional architecture in contemporary age changed by the introduction of the notions of the world culture and repetition and imitation without their assessment and the sustainability foundations of Iranian traditional architecture collapsed and as the result, the relationship between man and nature was also impaired, not only in the cultural aspects but also in the field of energy that is the basis of economy.

Currently, Iranian architecture is heavily influenced by the world architectural culture and its consequences, individualism, consumerism, materialism and many other features of global culture have resulted in indiscriminate use of energy and wasting valuable energy resources. Today, regardless of the principles of ecological design and with the use of technology and mechanical tools, much of the burden of adjusting environmental conditions is placed upon fossil energy. This leads to a drastic reduction in renewable energy sources and concerns about increasing environmental pollution and the resultant dangers, however, in contemporary age there are also a few buildings constructed based on the principles of sustainable architecture that in addition to providing all or part of their energy needs from sustainable energy sources, they are accountable for many of society's cultural needs and concerns in the form of the principles of sustainable energy.

CONCLUSION

Vernacular architecture that is strongly dependant on the local climate and culture can be an appropriate response to the reduction in energy sources (due to the impact of global culture of consumerism) increase in environmental pollution (caused by the indiscriminate use of fossil energy) uniformity of architectural design (due to the influence of global architectural culture, and neglecting climate design principles) and many other problems of Iranian contemporary architecture. However, sheer repetition and imitation of traditional architectural models is as wrong as the repetition and imitation of global architectural culture without an assessment. For creating sustainable development and energy sustainability in architectural culture it is necessary to review and improve the concepts of contemporary culture, evaluate the traditional cultural foundations and integrate climate-cultural solutions of vernacular architecture into useful parts of the global architectural culture (in terms of climate, time and culture) new technologies and contemporary culture of the society.

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