Sustainable Architecture, a Concept Implicit in Iranian and Chinese Houses

Ahmad Pourmokhtar1, Yida Guo2, Mahshid Azali Khoshgenab3, Hamidreza Rahimi4

1Ph.D. Candidate of Architecture at Yazd University.
24Ph.D. Candidate of Engineering at University of Liverpool.
3Undergraduate student of Central Academy of Fine Arts, Beijing.

Abstract

Sustainable architecture has become one of the main concerns of contemporary human beings. The concept of development in a variety of areas is important, which is usually classified in three broad areas: social development, economic development and the development of the environment. At the same time, the concept of sustainability is one of the most important topics in architecture. Since this global movement has expanded in the developed countries in the decades of the twentieth century, it has long been important in industrial and developing countries, such as China and Iran. However, the mere pursuit of modern and sustainability buildings may cause a city or country to gradually lose the characteristics of their traditional buildings. Chinese ancient architecture has similarities with Chinese traditional painting art, and achieves the harmony and unity of subject and object by scenes, Spatiotemporal Association and perceived synesthesia in the process of experiencing object. On the other hand ancient Iranian architect also has historically possessed precious experiences and teachings that all of Iran’s buildings in all regions and climates, including inland houses of the desert areas of Iran, have a close relationship with cultural, social and climatic contexts.

This paper studies the concepts and characteristics of sustainable development and sustainable architecture in Iran and China as a sample of Middle East and Eastern Asia ancient architecture. The content of this paper is expected to promote the design concept combining sustainability and traditional culture, and to bring new design concept to relevant designers and scholars.

Keywords: Sustainable architecture development, Warm and dry environment, Iranian home, Chinese home

Introduction

For any construction project it is mandatory to assess its performance and cost estimation. In many countries such as Nepal, a comprehensive comparative performance assessment was done for building project by using Economic, Social and Environmental indicator (Mishra and Rai, 2017).

Iran’s architecture has embraced itself in its long life; cities, villages and buildings have embraced a gradual evolution, with the accumulation of the experience of successive generations, and has relied on these historical experiences, based on the principles, foundations and characteristics that it responded well to the material and spiritual needs of the people of this land and was in harmony with history, culture and nature. The coordination of Iranian architecture with its historical, cultural and natural background, in addition to its roots in beliefs, culture, mythology and historical rituals, has had a close relationship with the natural and climatic foundations of the various regions of this border. The structural, physical and various elements of the structure Architecture in different parts of Iran greatly contributed...
to the diversity of natural areas and climatic zones, as well as their integration with their climates. The result of this harmonious relationship between man, culture, nature and architecture, the achievement of a living and sustainable architecture.

On the other hand, Chinese architectural culture can be divided into modern architecture, near-modern architecture and Chinese ancient architecture based on time. The architectural patterns of different periods have different styles. Chinese ancient architecture is well developed in the Ming and Qing dynasties. Roofs, pillars, brackets, bays, decorations, tenon and other elements are special. Artistic conception is an important category of Chinese traditional aesthetic thought, in Chinese traditional painting, the works through the description of space-time image, finally reached the artistic realm of “feeling and scenery, meaning and image”. Chinese ancient architecture has similarities with Chinese traditional painting art, and achieves the harmony and unity of subject and object by scenes, Spatiotemporal Association and perceived “synesthesia” in the process of experiencing object. The architectural landscape as a time and space in the transmission of artistic conception, in the interior and exterior space of the building transformation, the combination of architecture and scenery, thus “the external division of Nature, the source of heart”, is the director of Chinese Traditional architectural culture (Youbin, 2009).

Generally, the paper promotes the new concept of designing which consists mixture of sustainability and traditional culture, and also proposes the new design concept for designers.

**Sustainable Architecture**

Sustainable architecture has different definitions from the point of view of the world's architects. However, these definitions have common concepts, below are two different definitions of Sustainable Architecture by two well-known architects:

- **Norman Foster**: Architecture and design means maximum performance with minimal tools, i.e. the ideal use of architectural tools to save energy, instead of using a waste mechanical system that works with non-renewable fossil fuels and contaminated with the world. The direction of warming is guided.

- **Richard Rogers**: Sustainable architecture and design is a type of design that responds to today’s needs without sacrificing resources for future generations. In sustainable design, social and economic sustainability should be taken into account as much as energy consumption and the environmental impact of buildings and cities. Key points in sustainable design, low energy consumption, high flexibility and high efficiency in resource utilization (Hosseinmardi, 2004).

The sustainable architecture of the last two decades of the twentieth century has been accompanied by diverse tendencies and interpretations. Green architecture emphasizes the use of forces and natural resources in order to achieve resource efficiency and to provide conditions for the comfort of the interior as well as to the visual relationship with nature. Text-oriented architecture emphasizes the use of cultural-spatial orientational forces in the organization of the plan, and seeks to create harmony and harmony between architecture and its text. The ecothek architecture is modeled on how the natural systems operate and their functional features, creating architectural spaces and setting its environmental conditions with the help of technology (Farhadi, 2007).

For modern Chinese architecture. Consider today's technical conditions, building materials and the use of the external elements of the function are greatly improved, the whole copy of the existing shape to build classical architecture is outdated. So there are two kinds of models the house with modern style and the style of combined modern and ancient. For modern housing, in larger cities such as Shanghai, Beijing, Suzhou etc. Household buildings are relatively high. For some relatively small cities, most of the residential buildings are shorter because the land price is relatively less expansive (Cheng, 2006).

Figure 1. Traditional Chinese garden

For modern Chinese architecture. Consider today's technical conditions, building materials and the use of the external elements of the function are greatly improved, the whole copy of the existing shape to build classical architecture is outdated. So there are two kinds of models the house with modern style and the style of combined modern and ancient. For modern housing, in larger cities such as Shanghai, Beijing, Suzhou etc. Household buildings are relatively high. For some relatively small cities, most of the residential buildings are shorter because the land price is relatively less expansive (Cheng, 2006).

This research investigates the details of sustainable development and architecture in Iran and China as a sample of Middle East and Eastern Asia ancient architecture.
Iranian house (in case of warm and dry areas)

The place of myth is timeless and ongoing, the architects and the people of the past did not seek to repeat history, but the past was in the process of passing through and coming to the future. Thus, the designers and builders of the traditional houses of Yazd and Isfahan, Kashan and Kerman did not seek to repeat a historical pattern; rather, there was a past, as if they had been designed eternally and eternally, and they consciously or unknowingly continued it (Saremi, 1997).

The house is an absolute manifestation of slowly getting inside and throwing itself out of concern. And at the outset, in order to achieve this principle of purpose, man has mapped it. And in this map, the building is a building, the balance and cohesion of objects that set them in balance and fit and according to the nature of those objects and in view of the intrinsic nature of man.

In this coordination, each component forms together a “total” together and creates a space that in fact represents the atmosphere of the infinite world, and in this space, a person as a landlord thinks to come from the outside, and return to another word with this entry and say hello to you.

Today’s houses, however, do not express the truth out of the mystery of the mysteries of the mysteries, nor does the effect of that truth remain within them.

The vent of that infinite space is closed to the home. The windows are no longer open to the side that resembles the immortal sky and the nature of manuscripts.

The garden, this bright symbol of the Garden of Eden, has been plagued by famine.

The dock is dry and water does not fuse the fountains anymore.

The splendor of the house has become a stench, and no longer has any effect on the position of the landlord of the landlord (Tamidi & Taeb, 1993).

The main means to reach a person is comfort, shelter or home. The home or shelter must be such that it can absorb the comfort of life, that is, the environmental factors that increase the comfort of his life and the factors that reduce his comfort and quality of life. It is the task of the architect of environmental design that meets the biological requirements in terms of environmental factors affecting architecture and home such as air, temperature, radiation and humidity (Tavassoli, 1974).

Architecture of Chinese traditional houses

The regional difference of tradition Chinese architecture is relatively obvious, and there are normally lots of details included in the architecture. From the end of Qing Dynasty, China’s life was rapidly changing from traditional way to Western (since 18 century). From 18 century to 20 century, Chinese architecture and its traditional artistic manifestation have been extensively destroyed. At that time, the rich and the middle class were more like to move closer to the Western culture, so in that period of time, some of China’s original beautiful buildings were replaced by Western-style buildings (Sicheng & Qichao, 2002).

Chinese traditional architecture has its own independent system, which has a long history and wide spreading area. Although ancient China had lots of contacts with other ethnic groups in the military, political and ideological aspects, but the basic structure of Chinese ancient architecture and deployment principles of the evolution of the speed relatively moderate (until 18 century). There has not been a sudden abrupt transition in during the thousands of years. In addition, Chinese ancient architecture culture has never stopped slow change since ancient times. Therefore, it is difficult to rationalize the time division for Chinese tradition architecture (Sicheng, 1998).

In terms of time, the closest modern Chinese feudal dynasty was the Yuan Dynasty, Ming Dynasty and the Qing Dynasty. China’s capital in these three dynasties is in Beijing. For the Yuan Dynasty, the shape of capital is approximate a square, which has longer side in north-south direction and shorter side in west-east direction. The imperial city is basically built on the central axis of Beijing. At that time, the streets of China’s capital city were broad, and the intersection was roughly cross. In the middle of the city there is a house called Drum Tower. The Chinese traditional architectural shape of the roof is a bit like the Greek alphabet λ, as shown in the picture:

Pagoda is one of important component for tradition Chinese architecture. Since the Yuan Dynasty, the construction of Chinese pagodas began to shift from woody structures to brick structures. Brick towers with octagonal plane for its standard form, and occasionally have six of horns which also have a few square examples, but very rare. The pagoda in the Ming and Qing dynasties had a feature that was...
decorated outside with glass.

For the traditional Chinese house, consider Chinese ancient dwellings seldom pursue years. As a result, the renovation of ancient dwellings has rarely been maintained for more than three hundred or four hundred years. Hence the ancient styles of dwellings that can now be seen in China is either renewed or built through modern techniques but following ancient styles. Furthermore, the ancient residential buildings have different features because of the climate, topography and so on in different regions of China may have large differences.

Conclusion The issue of sustainable development and sustainable architecture is one of the major issues and fundamental human concerns today. Obviously, in the form of an article or study cannot be of different perspectives to pay for it, so in this article we have tried that with an overview of the concepts and general characteristics of development and sustainability as well as recognition of the principles and values of sustainable lies in the architecture of Iran and the traditional Iranian houses, they found a deep and logical interaction between them. At the end of this article, this is summarized as follows:

This approach to life and nature has led to the emergence of contemporary movements of sustainable development in the social, economic, environmental and architectural domains of architecture.

- Sustainable development seeks to develop in the social, economic and environmental spheres, which reflected architecture in the wake of the emergence of sustainable architecture. Debate surrounding sustainable architecture in the world and in our country is more concerned with the social, cultural and most of its emphasis on the interaction of architecture with nature and the environment and reduce energy consumption and use of renewable energy, so The vacancy of concepts such as beauty, identity, sense of belonging to the place and so on in the field of sustainable architecture is felt.
- Sustainable architecture is not a clear and prescribed package for all regions and peoples of the world, but any society, along with relying on the scientific and modern world experiences, must understand the history, culture, climate, and fundamental infrastructure of a sustainable and consistent architecture. Search for your terms. The ancient history of Iran’s architecture has sustained values that it has gained during a gradual evolution and accumulation of its historical experiences, inspired by these principles and values, along with the continuous use of the modern scientific knowledge of the world, can be the real meaning Persistent Iranian Architecture.
- Inspiring the values of the ancient Iranian architecture does not mean that the traditional architecture and its elements should be shaped formally and formally, because the life, culture and material needs of the modern human are different from the past and the shape and The traditional architecture of the people is in order to meet the material and spiritual needs and lifestyle of the people and cannot be reconciled with the spirit of contemporary time. Therefore, it must be inspired by a clever and logical look and approach of traditional architecture and interaction with the social, economic and environmental spheres and adapted them to the requirements of contemporary and contemporary architecture.
- At the end of this article, the author presents a definition of Iranian sustainable architecture.

Persistent Iranian architecture is a redefinition of the concept of sustainable architecture, which is inspired by the inherent values of the ancient Iranian architecture and its integration with the world’s most modern scientific experiences of the concept of sustainable architecture, followed by a kind of sustainable architecture that It is rooted in history, culture, identity, nature, climate, and material and spiritual needs of the people of this land.

About Chinese traditional architecture

Firstly, ancient China used timber as the main material. Generally the shape of the building and the materials will produce its unique structural mechanics, and thus produce its formal characteristics. In other parts of the world, especially in Western countries, stone is widely used in architectures. In ancient China, Wood was widely used as the main building material, so the ancient architectural form of China was basically the direct manifestation of wood structure. For the architectural structure of ancient China, it basically based on the nature of wood, the actual needs and aesthetics of housing design.

In the second, the structural principles of ancient Chinese architecture is based on the feature of timber. For example, one of the classic ancient Chinese dwellings was supported by 4 pillars with wooden beams. Depending on the needs of the structure, the beam structure of the roof can overlap several layers (Sicheng, 1998).

Thirdly, in ancient Chinese architecture, bucket arch are one of the key elements in the structure, and are the unit of measurement. The bucket arch are employed to transfer the load from above to pillars. In addition, the external contour of ancient Chinese architecture is obviously different from that of Western architecture. Normally the traditional Chinese ancient architecture is beautiful and attractive.

References

1. Mishra AK, Ar. Sunita Rai. “Comparative performance


7. Su-Ch’eng L. Writing a Modern Chinese Architectural History. 1984


Date of Submission: 2018-11-22

Date of Acceptance: 2018-12-11