Sustainability of Green Architecture in Urban Buildings

Fatemeh sohrabi
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1-Master's Student, Department of Architecture, Eram Higher Education Institute, Shiraz, Iran.

e-mail address: Fsohrabi59@yahoo.com

Abstract

The sustainability feature can be explained in different domains. The concept of green architecture, also known as sustainable development or green building, is adhered to buildings that are environmentally friendly. In the sustainable architecture we see that the building moves as part of the surrounding environment and its surrounding environment by saving and consuming the optimum energy of having materials consistent with the climate and placing in the ecosystem cycle to achieve the goals of sustainable development.

The purpose of green architecture in urban buildings is to limit the damage, including the release, contamination and loss of the components of the building that enters the environment. To create this limitation, the effects and design of healthy buildings should be explored and made clear from the environmental point of view.

In this paper, the compliance rate of patterns used in the green architecture of urban buildings with the principles of sustainable architecture has been studied. With extensive studies and studies it can be concluded that sustainable urban buildings, in addition to the physical needs of humans, also meet spiritual needs.

key words: Sustainability, architecture, green architecture, Urban buildings.

1-Introduction

Sustainability is a widespread and complex subject. Sustainability is important for the survival of human species and living organisms on this planet. One of the main goals of the human goals is sustainable architecture. For this reason, moving towards a more green architecture is recognized as the main goal of our present-day architecture. (Mohammadjavad, 2014, 235–246)

The goal of sustainable design is to find architectural solutions that can create prosperity and bio. In order to achieve this goal, there is no other way than the formulation of rules and regulations that designers, operators, and operators comply with not only with the purpose of
the definition of sustainability mentioned at the beginning, but also the green architecture, which would actually make the city's face more natural. (Rasooli, 1395)

Sustainable and eco-friendly architecture is one of the main goals that mankind has created to make it a better model for all its activities. For this reason, the move to green architecture is recognized as the main goal of our current architecture. (Hedayati Far, 1396)

Since sustainability is a goal for all humans and they are trying to achieve it, green architecture brings environmental, social and economic benefits. Environmental benefits include: reducing pollution and preserving natural resources, and its economic benefits, reducing the cost of urban planners to spend on water and energy and improve productivity. (Thomas Rettenwender, 2009)

The social advantage of green buildings is that buildings are beautiful and only make a slight change in the internal infrastructure. (Roy Madhumita, 2008, 868 – 873)

Green building design in the field of sustainable architecture and green architecture is also one of the solutions to climate change and to prevent unnecessary consumption of natural resources and resources. (marofi, 1395)

Green city buildings are a way of building and using more healthier models with more efficient resources to build, renovate, set up, maintain and destroy. (Roy Madhumita, 2008, 868 – 873)

2- Definition of architecture

The vocabulary is: Art and science of designing and building buildings

Architecture is associated with the space around human being as the most socially human art. The presence of space, building and city from the past to today and in the future, the moment of everyday life of humans is not absent and will not be. Cities are full of buildings designed using arts and scientific and mathematical skills. These skills are collectively called aesthetic elements. The principles of aesthetics derived from art, science and mathematics are used in architectural design, such as the application of line, shape, space, light and color to create a pattern, balance, rhythm, contrast and unity. These elements together allow architects to create beautiful and useful buildings. In short, aesthetic principles, along with structural aspects, help build a successful building. The subject of architecture is about space. Different definitions that have been proposed so far have often emphasized the importance of space in architecture, which is common to many of these definitions in the definition of architecture as a space organizer. In other words, the main theme of the architecture is how to organize the space in a creative way using a variety of materials and methods. From August's perspective, architecture is the art of organizing space and this art is expressed through the building. Eduard Miller, the oppucumber, is also the architect of art and the goal of organizing human beings. Architecture in the old world was regarded as a professional, on the one hand, from the most technical areas of engineering science to the most artistic aesthetic subjects, and on the other hand, the small-scale design of an element of an installation such as a water reservoir or bridge Small or stables to design a neighborhood and a city, and although in each of the domains above, people were more professional and expert, and there were hierarchies among different architects, but in sum, all of the above activities Was in the field of architecture. (beh nezhad, 1395)
3-Green architecture background

The combination of natural elements and vegetation with ancient process architecture is not a new idea in architecture. The design of the green spaces was at the same time the beginning of the architecture. For example, the use of the garden element has long been of interest to humans. The typical examples of these are the suspended gardens of Babylon, which by planting the plants on the horizontal and vertical surfaces of the walls and ceilings and its surroundings it was accompanied by all and all of the past attention of the human beings to the green architecture. The growth of the green process was scientifically first developed by building greenhouses in the nineteenth century in Canada and the United States. Modernist architects like Le Corbusier, Frank Lewis Wright and Roberto Tuberl are the main owners of architectural ideas. By carefully examining the traditional Iranian architecture, there are many valuable values in various fields of optimum use of energy and ecological utilization of various types of energy, and in particular the use of stable and immovable energies, which points to the interest of Iranian architects in this regard. In the years 57 - 47, that is, at the end of modernism, Nader Ardalan and Kamran Diba in Iran had a great deal to revive Iranian architecture, Mirmiran's activity was well underway in this period, and most of their work reflects their impact on Traditional Iranian architecture. In the years 57-67, along with the Islamic Revolution in Iran, the achievement of which is the creation of a traditional historical approach, nativeism and emphasis on Iranian and Islamic values, the tendency and tendency to the past can be seen in the work of architects.

In general, it can be argued that Iranian architecture represents a very wise knowledge and knowledge, and in any case, it does not mean that the high quality of the environment and the initiatives related to the use of energy are self-fulfilling and banal. (dabestani, e. baghai, 1395)

4-green architecture

Green architecture is one of the new approaches and approaches of architecture that has been attended by many officials and architects in recent years. Green architecture is more of a term with sustainable architecture, in fact, green architecture has its roots in sustainable architecture and sustainable development, which stems from the various needs of contemporary people in the face of the problems and problems that have arisen in the present-day industrial and industrial life of the present Is. Protecting natural resources and preventing their destruction, as well as reducing air pollution and other environmental pollution, on the one hand, and the sense of concern for the future of humanity, on the other hand, are issues that have arisen in this regard and the importance of considering it as a global task is to be seen. Architectural design is a design method based on the principles derived from nature. With the aim of respecting nature, it is sought after to work in harmony with the environment around it. Architecture that does not hide itself from the eye of the eye and not inspire itself to nature.

In general, green design can be considered within a triangular, with three levels of energy and climate and ecology. The final plot is a point inside this triangle, which tends towards the domination of one of the vertices. (dabestani, e. baghai, 1395)
5-Principles of Green Architecture

Green architecture has six important principles that are stated as follows:

**Principle one: Energy conservation**
Buildings that are interacting with the local climate in an effort to reduce their dependence on fossil fuels are more distinct from the experience carrier alone, and as a result of this, half-engineered quest for architectural design, modern day-to-day apartments are being raised.

**Principles two: Working with Climate**
Buildings must be designed in such a way that they can use the climate and energy sources. The shape and position of the building and the location of its interior spaces can be such that it improves the level of comfort within the building, while at the same time it can reduce the consumption of fossil fuels through proper insulation of the structure. These two processes have inevitably overlapping and many common points.

**Principles three: Reducing the use of new resources**
Each building should be designed in such a way as to minimize the use of new resources and, at the end of its useful life, create a source for the creation of other structures. It should also be noted that there is not enough interest in creating artificial environments in the world, so that a new generation of buildings can be used to rebuild a new generation of buildings. This reuse can take shape through the use of recycled materials or recycled spaces.

**Principle Four: Respect for users**
Green architecture respects all people who use the building. All buildings are built by humans, but in some structures the truth of human presence is respected, while in others the attempt to reject the human dimension in the process Construction is observed.

**Principle five: Respecting the site**
Each building should touch the earth in a calm and light fashion. Australian architect Glenn Moorcat states this strange statement: Buildings should touch the ground in a calm and light style. This statement has a feature of the interaction between the building and its site, which is essential for the green process, and of course it also has wider features. A building that consumes energy gently creates pollution and is alien to its consumers and users, and therefore never touches the earth in a calm and light manner.

**Principle Six: Holisticism**
All the principles of green need to be part of a whole-oriented process for building an artifact environment. Finding buildings that have all the principles of green architecture is not easy. Because the green architecture is still not fully understood, a green architect must include more than one single piece of building and must include a sustainable form of urban environment. City, inventory is beyond the scope of buildings; in fact, it can be seen as a collection of interactive systems - living and recreational systems that are built in shape with a body and with a close look at this Systems that we can portray the face of the future city. (Jafari A, Mehdi Nejad, 2011)

**Considerations related to urban green spaces**
Green Building has considerations in four main areas: development of construction site, selection and minimization of materials, energy efficiency and domestic air quality.

• Consider development of construction site to reduce the impact of development on the natural environment. For example, the construction of a building in a direction that is accompanied by sunlight, shadows and wind patterns that reduce heating and cooling loads.
• Proper selection of durable materials with recycled materials and internal production in order to minimize environmental negative impacts. There is a growing market for cheap recycled products.
• Incorporating a plan with high energy efficiency in the building to create an efficient and comfortable environment. The use of natural elements and technologies to maintain resources and increase the comfort / production capacity of residents while reducing long-term operational costs and pollutants. (CBFEE, 1999)
• A plan for excellent indoor air quality to improve the health and ability of the inhabitants
• Minimizing waste in building and demolition processes by recycling materials and disposing them or recycling them. (CGB, 2009)

Green Building and Its Benefits

According to the researchers in the field of green architecture, the green building is a building whose negative effects on its environment are minimal. The US Department of the Environment defines green building as a process to improve the quality of buildings where buildings and their location from water, energy and materials, and building the negative effects of the building, run and maintain a lifecycle A building reduces design on human health and the environment through better placement. Therefore, green building does not harm the environment, it may even help to cure the effects of damaging landscapes.

The benefits of the green building are as follows:

1- Meeting the needs of residents
2- Satisfaction and satisfaction of users
3- Exploiting Sustainable Architecture Approved Solutions. (dabestani, e. baghai, 1395)

Design of green urban buildings

1- The smaller is better. Take advantage of a good layout of interior spaces so that the overall size of the building and the resources used to build and maintain it is kept to a minimum.
2- Design a Energy Saving Building. Use high-performance insulators and high-capacity windows in the direction of sunlight (thermal radiation in the east and west) with a hard-sealed structure. Clinging buildings will minimize the cost of inadequate external coatings.
3- Free comfort The warmth of the sun, daylight, and natural cooling can be highly effective in most buildings.
Principles of Urban Green Building Design

Designers are able to create a composition in their buildings, imitating the functioning of a particular ecosystem. Also, one of the types of advances in the natural ecosystem is the use of a natural environment in human construction. Creating new canvas in buildings in the urban area is important. Specifically, it supports the diversity of ecosystems and their health. Reducing the energy consumption of buildings from an economic and ecological point of view is an essential element.

Generic solutions to the architecture of sustainable green architecture can be divided into several parts in relation to incomplete energy sources, in general: the sun, water, land, wind and plants, and the nature of each of these resources can be directly or indirectly used in a sustainable building. Common systems are divided into active or passive use of natural resources. The inactive system is known for not using any kind of electric energy. The solutions adopted in this type of design generally involve designing a stable form, orienting towards sunlight and wind, taking into account the climatic conditions in the design of the facade. Inactive mode requires an accurate understanding of the context of the site and the design of the form should not only be in line with the climate of the area, but also maximize energy savings and user comfort.

The system is active. This state of affairs refers to the way in which the system, another system used in the use of natural resources electromechanical, is used. For example, the use of a ventilator in the roof, the use of hot water for heating in the walls of the building, the evaporation of refrigeration and ... Inactive and active mode can never alone provide the satisfaction and comfort of the users.

Also, in relation to green building materials, it should be acknowledged that green building materials are generally composed of renewable sources rather than non-renewable resources, and are responsible for the environment as a result of their lifecycle impact. In addition, the overall achievement of green building materials improves the cost-effectiveness of maintenance and replacement over the lifetime of the building to maintain energy, and residents’ health and productivity. Green building materials can be evaluated with features such as: reuse and sustainability, and the speed of material remediation, elimination or reduction of harmful greenhouse gases, removal or reduction of toxic materials, recycling. (Hedayati Far, 1396)

The Purpose of Green Architecture
Green design is practical for problems in which natural resources are damaged before, during and after production and construction, to the least extent. In addition to this, the materials should be useful, have a long shelf life and be reversible to the natural cycle. Long-life products are both useful and the biggest barrier to waste and waste, and this is better than reuse or recycling. (Samin Sharifi Miyavi, 1395)

The principles to be followed in this architecture include:

1- Perception of the sense of place, the space of existence and the lack of disturbance in it
2- The use of natural environments such as solar energy, wind, etc.,
3- Application of natural and native materials to be recyclable and durable
4- Collecting and using water, especially rainwater, and using water from the lake, sea and...
5- Sound insulation, sound and insulation of the building
6- Natural ventilation with roof

Correct illumination and proper design of openings. (marofi, 1395)

The need to build green and sustainable urban buildings

The industrial transformation of man from life in nature to life in the city. With the advent of technology, the life-style of life transformed so much that humans used fossil fuels as heaters to warm themselves instead of covering more and using warm clothes. Wind turbines, canopies and lighters in the building replaced their heating and heating facilities. In this way, technology has provided an ever-increasing comfort to humans. As a result of urban agglomeration, many natural lands and shoals have undergone changes. For traffic, construction, cooling and heating, energy consumption has increased and as a result of air pollution and noise pollution has increased. Cities are saving energy and creating waste and pollution. As a result of the industry's progress, the need to exploit natural resources has also increased, so that illegitimate exploitation of natural resources leads to their destruction. In order to continue to live in this cycle, human need for energy has increased, but now we are at a stage where energy resources are coming to an end. With this low-profile approach to reducing problems, building sustainable, sustainable buildings is highlighted with regard to the environmental problems that exist. (Ahmadi, 2012)

Principles of Sustainable Urban Buildings

The process of building a sustainable building begins with a thorough understanding of the building's location with all its beauties and complexities. The ecological approach to design is aimed at integrating systems that are ecologically active in the area that performs the nature of their mother. These ecological activities provide habitat, react to the movements of the sun, cleanse the air, and extract, filter and store water. Species that work in natural ecosystems may also use habitats constructed in synthetic structures. The construction of new habitats in structures in urban areas is important for the benefit of biodiversity and healthy ecosystems.

The following points summarize the key principles, strategies and technologies that relate to the five main elements of green building design: sustainable site design; water and energy...
conservation and quality; environmental quality; and material and resource conservation. These data confirm the use of the USGBC LEED Green Building Verification System, but their focus is on specific solutions or technologies of principles and strategies that are often specific to the site and the project changes to the project. (USGBC, 2008)

**Examples of Sustainable Green Architecture in Urban Buildings**

- Use of natural energies in everyday use.
- Use of waste and especially the use of wastewater in the production of water needed for irrigation of green space.
- Applying appropriate methods to reduce or control energy loss and optimize energy consumption.
- Use of non-chemical recyclable materials and materials that are not in conflict with human health.
- Design and construction with materials close to nature.
- Avoid the negative effects of building and its products on the environment.
- The use of natural plants as an inspiration for live design in conjunction.
- Avoid Damage to Land Condition to Earn More Profit.
- Achieving the highest quality of life in the shade of reliance on the environment.
- How to use the land.

Attention to the climate of the region. (Samin Sharifi Miyavi, 1395)

**Living Architecture**

An environment like ours can change nutrients and waste. Live architecture focuses on the process that combines ecological activities in buildings to extract, store and refine water, clean air and process other nutrients. Living architecture also addresses biophilia and the well-known benefits of living in contact with living systems and the healthcare environment. [15] During the whole history of the appearance of external walls and roofs of buildings has been seen. The reason for this is the increase in insulations (keeping cool in the summer and warming in the winter), improving aesthetic aspects, improving the interior and exterior atmosphere, reducing greenhouse gases such as carbon dioxide, carbon monoxide and nitrogen dioxide, as well as increasing ecological values by building habitats for birds and insects. (Vandermeulen, 2011, 198–206)

**Conclusion**

Green architecture or sustainable architecture is one of the new trends and approaches of architecture that has attracted many contemporary designers and architects in recent years. This architecture, which derives from the concepts of sustainable development, is one of the basic human needs in the current world for its adaptation and coordination with the environment.
Sustainable design demonstrates a new attitude to architecture. For a sustainable architecture, having a good architecture is not enough. Instead, it is necessary to respect the environment and nature and to have knowledge about canvas, topography and weather conditions. In the world today, the use of green buildings has become increasingly important due to the major problems such as global warming, air pollution, excessive consumption of energy and high economic costs. The goal of creating green buildings is to improve the climate, Preventing waste of energy used for cooling and heating and preventing the negative effects of construction on the environment. Buildings that use features that have the least negative impact on human health and the environment. In this work, the reduction of the use of new resources, respect, between designing green buildings with principles such as protection The energy of the users is a respect for the site and for the keynoteism that the realization of these principles in the design of modern spaces in order to achieve the concept of green building is imperative and difficult. Before a green building is created, like everything else, it needs a creator. This will help create and sustain the green building for the health of the individual living in and around the environment, and will make them happy and useful. This requires the accuracy of the architectures certified. Green architecture brings environmental, social and economic benefits. Environmentally, green architecture helps reduce pollution, protect natural resources and prevent environmental degradation. Economically, it reduces the cost that building managers need to spend on water and energy, and improve their ability to produce using equipment. In addition, socially, green buildings are beautiful buildings and only create a slight deformation in the internal infrastructure. With the encouragement of identifying existing green buildings from the past, we hope that we can come up with sensible solutions to the construction of sustainable green and sustainable buildings.

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