



Towards Acquiring the Environmental Skills and Trends Required to Achieve Environmental Architecture

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Abstract

In the last decade of the last century, most countries in the world paid particular attention to the issues of environmental protection and sustainable development. This concern was not born in a vacuum. Environmental voices calling for reducing the environmental effects of various human activities called for reducing waste and contaminants and maintaining the natural resource base for the next generations.

As a result, urban sectors are no longer isolated from the pressing environmental issues that have begun to threaten the world. In the last few years, these sectors have been considered to be one of the main consumers of the natural resources of land, materials, water and energy. On the other hand, the construction industry the complex and the result of large amounts of noise and pollution and solid waste. The problem of waste of energy and water remains one of the most important environmental-economic problems of the buildings because of the continuity and sustainability of the buildings throughout the period of operation of the building.

For these and other reasons, and as a result of growing public awareness of the environmental impacts associated with construction activities, some specialists noted that the main challenge facing the urban sectors at this time is their ability to meet their commitments and fulfill their developmental role towards achieving comprehensive sustainable development concepts. On urban projects will be one of the most important competitive standards in these sectors in the 21st century. Hence, in the advanced industrial countries, new concepts and methods that were previously unknown in the design and implementation of projects have emerged. These include "sustainable design", "environmental architecture", "green architecture" and "sustainable buildings"

These concepts are all new ways of design and construction that evoke the environmental and economic challenges that have cast a shadow over the various sectors of the age. The new buildings are designed, implemented and operated with advanced techniques and technologies that contribute to reducing environmental impact

Hence, the problem of research is the weakness of the methods that would achieve environmental architecture, while the methodology of research focused on descriptive analytical method in determining the methods and procedures necessary and the importance of acquiring skills to achieve environmental architecture and then the research reached a number of conclusions and recommendations.

Keywords: Environmental Skills, Environmental Architecture, Environmental effect

1. Introduction

Architecture Sustainable environment is an architecture that is the result of its environment and is responsible for its direction, that is, architecture that respects the earth's resources and natural beauty. It is an architecture that provides the needs of its users as it leads to the preservation of their health, their satisfaction, increase their production and satisfy their spiritual needs by taking care of the implementation of proven strategies for environmental sustainability. Environmental architecture is distinguished from large buildings only in that it is designed to minimize the impact of human habitation in any given ecosystem. It can be self-sustaining and employs all or most of its own available resources for a comfortable life such as energy; climate control; food production. Water conservation and air purification. Sewage treatment etc.

Environmental architecture is designed to make it possible to provide these features to a large population. Environmental architecture will supply and maintain its own municipal or urban

infrastructure to work and connect with other urban environments away from its own.

2. Research Problem:

There is a decline in architecture and poor compatibility with its environment because it is not based on the foundations and design trends that are compatible with the environment

3. Search Hypothesis

The adoption of architecture on the basis of design compatible with the environment leads to the realization of environmental architecture that forms the urban fabric, which contributes to control the extent of sustainability.

4. Research goal

Need to acquire the skills and trends required to achieve environmental architecture and put it into effect.

5. Research Methodology:

The method of deconstruction of the concepts contained in the research hypothesis, which forms the basic concept of the environment, has been adopted to achieve a high level of well-being.

5.1. Environmental Architecture

The term "archeology" means architecture and ecology, which is the field of creating architectural design principles for densely populated housing and low impact on the environment.

The concept was first conceived, and the term itself was formulated by architect Paolo Soleri, where he assumed that complete environmental architecture would provide space for a variety of residential, commercial and agricultural facilities and reduce the individual human environmental impact.

Environmental architecture was proposed to reduce the human impact on natural resources. Frank Lloyd Wright proposed an early version of Prodecker, but, in contrast to environmental architecture, Wright's idea is relatively two-dimensional and relies on the road network.

Paolo Soleri proposed solutions later, and coined the term "environmental architecture" [1]. Soleri describes ways to compress city structures in three dimensions to combat two-dimensional urbanization, to the economy of transportation and other energy uses. , Suggested that Soleri's changes in transportation, agriculture, and commerce were similar to Wright's proposal, but Soleri explored reductions in resource consumption and land reclamation; he also suggested limiting many private transport. He called for more "measure" and preferred greater use of shared social resources, including public transport.

5.2. The Direction of Environmental Architecture

Environmental architecture is a science that guarantees a building to be designed in a manner that respects the environment while taking into account the reduction of energy consumption and materials, and also reduce the impact of construction and operation on the environment and maximize harmony with nature.

The trend towards environmental architecture is one of the contemporary architectural trends aimed at finding environmentally friendly and energy-efficient buildings through the development of natural resource management. This requires the use of positive and negative energy systems and the use of materials that cause their manufacture and use and eliminate as little damage to nature as water , air,and the earth .The unsustainable political and economic systems within cities, as well as the various daily activities and practices within them, are responsible for harming the environment and the negative impact on its components, and on all forms of environmental corruption occurring within it[2] .

5.3. Principles of Environmental Architecture:

5.3.1. Healthy Internal Environment:

All necessary materials shall be taken to ensure that all materials and structural systems used do not cause the emission of harmful substances or gases, while renewing and purifying the internal air.

5.3.2. Energy Efficiency

All necessary measures must be taken to ensure that the minimum energy requirements are met by using cooling, heating and lighting systems and techniques to guide consumption.

5.3.3. Environmentally Safe Materials:

All necessary to take into account the use of building materials and products to reduce the degradation of the surrounding environment.

Wood is used for example to ensure that forests are not destroyed, and the choice of other products is determined by the amount of harmful products that are associated with manufacturing and operation.

5.4. Environment-Friendly Body:

Everything must be done to connect the building body and its design with location, territory, climate and solidarity with nature and to promote a harmonious relationship between it and the users of the building.

5.5. Functionally Good Design:

The research and expression of symbolic relationships that represent natural elements and spiritual principles, resulting in well-constructed buildings that are comfortable to use and beautiful, must be taken into account. The relationship between environmental data and technological data and try to balance between them and reach a sustainable architecture with the environment

4. Strategies for Sustainable Environmental Architecture:

4.1. Sustainable Design:

Sustainable design is the overlap between architecture and electrical, mechanical and structural engineering. In addition to the attention to traditional aesthetics of size, proportions, scales, texture, shadows and light, the building design team should be concerned with long-term environmental, economic and human costs. The Rocky Mountain Institute has identified five elements for sustainable design:

Inclusive planning, design and the importance of primary decisions, as they have the greatest impact on energy efficiency·

Considered sustainable design as a building philosophy rather than a proposed model of construction, since buildings built with this thought are not thought-specific or character.

The cost of sustainable buildings should not be increased from traditional buildings, nor is it different from simplicity or complexity of design.

Integration of design as each element is part of the whole and essential to the success of this design.

Reducing energy consumption, maintaining and improving individuals' health is the most important principle of sustainable design.

Other Design Elements Include:

- Energy conservation·

- Take into consideration the architectural features of the building•
- Study the outer envelope of the building and the extent of energy conservation•
- Use mechanical and electrical systems for energy efficiently•
- Provide adequate health conditions for building users.

As one of the most important things we are currently seeking to achieve is the establishment of healthy environments free of pollution and will illustrate this by addressing the means of thinking green building of the architecture of the sustainable environment in the selection of building materials and the preparation of the environment that takes into account the importance of health and safety of users of the building.

4.2. Sustainable Construction

Sustainable construction is the creation of a healthy environmental management based on the efficient use of resources and respect for principles conducive to harmony with the environment. Buildings designed in a sustainable manner aim to reduce their adverse impacts on the environment through energy and resource efficiency. The buildings are considered to be one of the biggest causes of damage on the ground. The pollution resulting from the heating and cooling of the internal environment of the buildings is greater than the pollution caused by automobile exhausts even in the United States. In addition, the building materials industry consumes huge energy and non-renewable resources.

The concept of sustainable construction includes a set of strategies during the design, construction and operation of construction projects. The use of environmental architecture materials and products is an important strategy in the design of the building. Sustainable building materials offer many advantages to the owner and residents of the building•

- a. Reduce maintenance and replacement costs over the life of the building.
- b. Energy conservation.
- c. .Improving the health and productivity of residents.
- d. .Reduce the costs associated with changing the shapes of spaces.
- e. .Unlimited flexibility in design.

Construction and construction activities around the world consume more than 3 billion tons of raw materials annually or 40% of global use of materials. The use of sustainable building materials helps to rationalize the world's diminishing and non-renewable natural resources. In addition, the integration of environmentally friendly building materials into construction projects can reduce the environmental impacts associated with the extraction, transfer, conversion, manufacture, construction, reuse, recycling and disposal of materials used in the construction industry.

A large amount of energy and materials can be saved in the construction process through the reuse of building materials for old buildings rather than the use of new materials requiring additional cost and energy to manufacture, transport and operate[3].

5. Architectural Strategies for Sustainable Environmental Design

Sustainable environmental design requires the adoption and balance of a range of conservation strategies that include:

5.1. Design Solutions Should Be Developed From the Site

Sustainable environmental design has begun with intimate knowledge of the place and its characteristics to respond to local conditions and local populations. The more design is sensitive to the characteristics of the site, the less harmful it is to the environment

5.2. Confirmation of Natural Processes

Sustainable environmental design adopts the concept of natural cycles and processes (sunlight, lighting, ventilation), evoking the natural environment within the design and confirming our knowledge of nature.

5.3 .Design with Nature

Design with nature is by respecting other ecological systems in the surrounding environment and their stable biological processes, incorporating new processes that work and contribute to production rather than depletion and consumption[4].

5.4 .Ecological Accounting

The environmental effects of design should be studied as a kind of ecological accounting to use the results of the study to report the environmental impact and environmental considerations necessary to maintain the desired environmental balance.

5.5. The Adoption of the Principle of Participation

The principle of participation in design from all parties connected to the building, as well as listening to all opinions to contribute to the process of remediation and environmental remediation of the site as well as through improvements to the practices of negative individuals also works[5].

6. Materials and Products of Environmental Architecture

Environmental building materials contain more renewable resources than non-renewable resources, and (environmentally friendly) materials preserve the environment because their impact is limited over the lifetime of the building.

Based on the objectives of the construction project, the evaluation of environmentally friendly materials involves the assessment of one or more of the following criteria:

Sustainable Material Selection Criteria / Environmental Architecture Products

- A. Efficiency of the source
- B. ..Internal air quality.
- C. .Energy efficiency.
- D. Water conservation.
- E. Availability.

6.1. Efficiency of the Source

This can be achieved by using materials that meet the following criteria:

- a. Contains recycled materials:
- b. Natural, abundant or renewable:
- c. Made from efficient resources
- d. : Locally available:
- e. Recovery, refurbishment or recycling:

- f. Re-use or recycling:
- g. Product packaging made from recycled or recyclable materials:

6.2 .Internal Air Quality Is Improved by Using the Following Standards:

- a. Non-toxic or low toxicity:
- b. Low chemical emissions.:
- c. Low emission of volatile organic compounds:
- d. -moisture resistance:
- e. maintained in a healthy manner:
- f. Systems or equipment:

6.3. Energy Use Can Be Increased Using Materials and Systems that Meet the Following Criteria:

- a. Materials, components
- b. Systems that help to reduce energy consumption in the building and facilities.

6.4. Rationalize Water Consumption and Can Be Obtained Using Materials and Systems That Meet the Following Criteria:

- a. Products and systems that help reduce water consumption in buildings and maintain water consumption in the vicinity of the building.
- b. The ability to obtain building materials for green architecture and this can be taken into account when the cost of the life cycle of the construction product can be compared with the traditional building materials or the percentage of the overall project budget.

6.5 .Three Basic Steps to Choose the Product

Product selection can be initiated after the establishment of the project's environmental objectives. There are three basic steps to the environmental assessment process for the product to be used in construction.

- a. Research
- b. Evaluation
- c. Choice

6.5.1. Search:

This step involves the compilation of all the technical information to be evaluated, including manufacturer-specific information

6.5.2 .Evaluation:

This step involves ensuring technical information as well as capturing non-existent information.

6.5.3. The Choice:

This phase involves the use of an assessment matrix to measure the environmental criterion of a particular project. The total value of each product rating is an indication of the higher environmental qualities of the product.

7. Similar Realistic Projects

Archosante is an experimental "architectural model" - a demonstration project under construction in central Arizona. Designed by Paolo Soleri, the main purpose is to show Soleri's personal designs and his application of the principles of

environmental architecture to create a human-friendly urban model.

any cities around the world have proposed projects that adhere to the principles of eco-architecture design, such as Tokyo and Dongtan, near Shanghai. Dongtan project has collapsed, and failed to open the Shanghai World Expo in 2010 [6].

Urban projects reflect some principles of environmental architecture. They often provide good human communication systems with a wide range of goods and services in a single structure.

Downtown Toronto has an underground pedestrian network, (PATH). Many tall buildings are connected by a series of underground tunnels. It is possible to live in this complex without the need to venture abroad, but the PATH network is not self-sufficient, nor self-sustaining at present. The total network extends 28 kilometers (17) miles.

The McMurdo Station of the United States Antarctic Program and other scientific research centers in Antarctica resemble the popular concept of environmental architecture as a technological development of a self-sustaining human society. The Antarctic Research Base provides living and recreational amenities for about 3,000 staff members visiting each year. Its remote location and measures needed to protect its citizens from the harsh environment give it isolationism. The station is not self-sufficient ..

Crystal Island is a proposed environmental architecture in Moscow, Russia. In 2009, construction was postponed indefinitely due to the global economic crisis.

Pegic towers act like a small environmental architecture that includes nearly all of the residents of Yatter, Alaska. A pair of buildings contains housing as well as school, grocery, and municipal offices. At one time, Yatter was proud of the second structure known as the Buckner Building. The Buckner building is still standing but considered unfit for habitation after the earthquake of 1969.

Most proposals to build real environmental buildings have failed because of financial, structural or conceptual shortcomings.

Environmental buildings are therefore found primarily in fictional works [7]. A great example of this is the allegiance oath to Larry Neven and Jerry Bournell. In the novel, part of Los Angeles residents moved to environmental architecture studying the plot of social changes that produce, both within and outside environmental architecture.

Environmental architecture was thus presented not only as a tool for the plot but as a subject of criticism.

In a world-wide novel by Robert Silverberg, most of the world's 750 billion people live in giant skyscrapers, called urbmons, each of which contains hundreds of thousands of people. Urbmons are arranged in "constellations". Each urbmons is divided into "neighborhoods" of 40 or more floors. All the needs of the population are provided within the building - food is grown outside and brought into the building - so that the idea of going outside is heretical and can be a sign of insanity [8]. A book on human life in an age of very high population density [9].

8. Conclusions

1. Environmental architecture is one of the components of the manufactured environment, which made it a sustainable architecture as one of the modern trends of architectural thought,

which deals with the relationship between the building and its environment, whether natural or made.

2. The emphasis on the importance of achieving the integration of the functional performance of the building on the one hand and the aesthetic and creative performance on the other hand in contemporary buildings, helps in raising the level of functional and creative performance in architecture.

3. Upgrading the level of architectural practitioners by developing creative studies in architectural design by choosing the current of the construction style that achieves the functional role of the building and taking into consideration the response to climate and technology, civilization and location, as reflected in the philosophy of climate-friendly architecture.

4. The importance of environmental awareness in the fields of architectural and urban design and urban planning in order to be compatible with the surrounding natural environment.

9. Recommendations

1. Giving the environmental dimension more attention when preparing urban plans in cities

2. Adapting and adapting to the surrounding environment, achieving social and economic efficiency, ecological balance and visual image that reflect the characteristics of the environment .) Attention to self-shadow based on the method, style and method of distribution of blocks and spaces to obtain the largest possible area of shading. It is also important to add additional shading elements to support self-shading through natural or artificial elements.

3. To consider the agricultural activity in the region in line with the current developments and the starting point of the cultural, social and environmental heritage of the city.

4. Study the sizes, dimensions and characteristics of the architectural spaces in accordance with the requirements and needs and nature of the area.

5. Control the routing of blocks, and spaces to allow air traffic to pass through them, to allow exposure of blocks to air movement.

6. No return to the style of internal courtyards, which are the best patterns to protect from wind-loaded sand in dry or desert areas.

7. Address the main causes behind the chaos in the city, from weak urban planning, natural and industrial phenomena.

8. The architectural field needs more serious studies to understand the wisdom and the structures that lie behind the forms of the built environment in order to accommodate the architecture as a comprehensive holistic concept that defines the quantitative relations of architecture with and around humans.

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