

Sustainable Architecture, Conception to Realization



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Abstract

Following the complexities emerging in the new world, human has witnessed unprecedented revolution in almost every aspect of scientific, cultural, economic, and political world. Huge insight into molecular structure, reaching the depth of the space, predominant revolution in communication and media, and the development of various new sciences such as biotechnology have all resulted in specialization in various fields of life. Recent tendencies in societies have caused subjective concepts in various fields of science of which architecture is no exception. Since architecture is deemed a practical science, the active role of architectural design can be realized if only it can come into close contact with the realities of the society and strategically deal with the question of improving the quality of life and with the social complications. Sustainability has turned into a serious concern in the contemporary architecture. Tackling the environmental problems of cities like air pollution, overconsumption of fossil fuels, resistance and security of buildings is considered a major concern of architecture and urban planning. In this paper the subjective concepts related to sustainable architecture in the first place, and later the Realization of such concepts in sustainable architecture have been studied. The research method is library study and the results will be proposed as practical guidelines in architecture.

Key words: sustainable, sustainable architecture, environmental ethical, Conception, Realization

1. Introduction

From the perspective of sustainability as a moral attitude could not be considered as sense of twentieth century, the roots of sustainable architecture from point of view coexistence with nature go back as long as architectural history. However, sustainable architecture, as revised principles and approaches in modernism architecture-based system of environmental ethics, is an approach that was introduced and has been taken in the second half of the twentieth century for responding to numerous problems and the wrong decisions were occurred in the field of human environment. Environmental moral order can be a new sense of moral order in which the human place in nature and valuable place of nature has been revised on the human decisions. The reflects of this thinking on how to interpret modernism towards thinking environment oriented in the 19th-century and the

first half of 20th century was simultaneous with rewrite a moral agenda in modern architecture has been associated with environmental ethical framework is adapted. (Hagan, 2001). Therefore the roots of environmental sensitivities could be pursued in architecture till 19th century just as the simultaneous formation of modernism.

Raskin and Morris (2002) challenged industrialization thinking in modernism as a paradigm for saving of human and satisfying his physical and mental needs in the different policy and each of them emphasized to attention on each aspect of environmental factors in the architectural. So, in responding and objecting to the inhumanity of modern architectural space, it will begin a movement in modern literature to optimize it in order to the indigenous and traditional architectural values and functions can be raised again.

Raport book called "shape, home, culture" (1969) with the counting multi-dimensional meanings of indigenous architecture and the combined sensitivity to climate, resources and social factors - cultural as well as Paul Oliver book, "Shelter and Culture" (1969) that explain examples of indigenous architecture of different regions of the world as a social-cultural phenomenon ,had a significant impact in this field . (Mahgoub, 1997). After the industrial revolution and the discovery of fossil fuels, man consumed it in its public buildings without regard to the issue of limited fossil energy resources at the time of initial discovery of the challenge was not raised in this area. On the other hand, lack of attention to the consequences of consumption fossil fuel leads to a lack of resources and environmental pollution crisis due to increased co2 in the atmosphere. So factors such as energy shortages, high prices of fossil fuels and 50 percent share of manufacturing in the human environment, material and energy resource consumption on the one hand and increasing urban population and consequent development of cities on the other hand caused the architecture leads to "Energy Efficient Architecture," in the 1970s. Structures that were designed to optimize the use of renewable energy sources with the aim of decrease fossil fuel consumption to provide living conditions (heating, cooling, ventilation, lighting and humidity) has been going through in the Earth's surface.

2. Sustainability as a developmental perspective

In literature of sustainability concepts have different meanings and there are many concepts of it. One of them that set forth as a vision of human development and how human thinking about existence world. On the other hand sustainability was expressed in three main areas; ecosystems, social and economic that has been the common denominator to these three areas are known as sustainability. These meanings can identify sustainability more correctly and critically. Concept of sustainability suggests a cultural and social evolution, a different attitude about the world around us and the patterns and styles of life improved, at least in western countries. This concept confirms that it is global subject and it is related to primary subject of population growth and the resulting impact of human life on earth. According to Brundtland report, sustainable development is meaningful when it can supply the present needs without compromising the ability of future generations to resolve their needs. This definition contains three main parts: first, this definition accepts the concept of needs, especially the Third World basic needs like food, clothing and housing are essential for human life. Secondly, it accepts the other needs to sprig up and bring moderate and true way of life. Thirdly, this definition accepts technology resources and community organizations that are associated with environmental capability is lasting for a long time to provide current and future needs to meet. This definition includes local and global concerns and have political dimension that following topics contain controlled sources and inequalities between developed nations and is being developed. so sustainable

development will be followed as improved quality of life as the same attention to environmental constraints ecosystems.

With the considering concept of sustainability, strategies currently based on public issues or concerns has emerged. Continuity, minor changes and major changes or replacing issues can be put desired effect by institutional settings, such as political events, changes in technology, scientific discoveries - disasters, economic practices and processes. With this view the green ecological approaches are signs that the environment will provide the conceptual design of buildings should considered essentially their relationship with nature and its impact on the natural environment. As mentioned the formation of these concepts could be seen in the early 1970's more or less. In the same period, titles were emerged such as minimum energy, solar energy or ways to disable or passive, which refer to ways to design, to reduce dependence on fossil fuels for use in the building. Therefore, sustainable architecture is a modified concept of architecture in response to numerous concerns about the impact of human performance in the present age. Stable expression, are used for making the distinction from other conceptualizations, but clearly cannot be responsive to all concerns.

Main bases of sustainability as a human approach to the biological world are based on "moral environment system". (Williamson et al. 2003). This moral environment system was introduced moral theory and moral foundation as environment-oriented attitude in the third half-century (late 1960 CE), and the discussions framework is based on more the interaction between humans and environmental ethics than placed on human interaction with each other.

1 Superficial environment tendency

This tendency, ethical, raises human centered attitude which intrinsic value that only applies to humans. (Egare. 1995). In this movement, concerns about human comfort and productivity is in the first aspect of the importance and environment and related issues from the perspective of their impact is considered remarkable on human productivity and the importance (Williamson et al. 2003). Thus the tendency of surface environmental attitudes, elements and phenomena values of inhumane is not innate, but the elements of natural environment enjoy in terms of their usefulness as a tool or a phrase of "instrumental value» (E, Gare. 1995). Thus ethical attitudes environmental surface orientation is the foundation surface approach to sustainability in which nature can be viewed as a source of human activities and to continuing to benefit human should be management and maintained. (Van Der Ryn & Caltborpe. 1986)

2 Middle environment tendency

In this tendency, instrumental attitude is adjusted to the nature. In this orientation, the principle that human and human phenomena, are the only items that have value to be rejected and not only the various elements of environmental regard to human targets and destination, but also contain the inherent worth of components and environmental elements as a whole (Sylvan & Bennett. 1994). However, in the middle position, the main issues and concerns related to human society, including ensuring the vital needs and trying to achieve more desirable living conditions remains the first priority and has a higher value. Therefore the first priority class is moral man and the next class is inhuman implementation in the biological world. For example animals and plants, living things and natural phenomena (such as mountains, soil, sea and ...) Most of the environmental

protection movement in the intellectual and moral system are committed to such topical itself. (Williamson et al. 2003).

3 Profound environmental tendency

The ethical stance, human is placed beside other elements of the environment as the same value with them: "In Profound position, believing that humans and human projects as only valuable options or consistently have a higher value than other elements are rejected (Sylvan & Benett. 1994). Therefore Profound environmental movement answers to fundamental philosophical questions about how human communication and inclusive environment and deals with whatever is in analysis of environmental issues that have primarily importance, "how human attitudes to the universe and achieve a comprehensive outlook " (E, Gare.1995).The unique human ability to master the other elements in the universe system interpret as a moral responsibility for his in this moral position: "allow and possibility to coexistence survival to other elements of biological systems in the world and with human type in environment (Sylvan & Bennet. 1994). In moral decision making based on prejudice attitudes, biosphere and its major ecosystems, as an integrated entity, are very important and what are the considerations for its components, including humans, animals and plants in comparison to major health system have less important. This attitude from the perspective of moral theory is the most excellent approach to sustainability. But in practice ,such a moral position is not foundation of decision making based on stability approach , because the restrictions, including minimum human intervention and changes has been followed in the environment.

Share Of building	World Resources and Reserves	Share Of building	Global pollution
50%	Energy	24% (cities)	Quality of atmosphere
75%	Fossil fuels (cities)	40%	Greenhouse Gases
42%	water	50%	
50%	Resource materials	40%	Contamination of drinking water
48%	Disappearing from farms	20%	Sepulchral wastes
50%	Disappearing from coral reefs (indirect)	More than 50%	(Developing countries)
		50%	CFCS/HCFCs

Table 1. Statistics related to the share of manufacturing in creating human environment again and environmental outcomes

Reference: (Edwards (b).2001) and (Hagan.2001)

3. Architectural response to the sustainability

Environmental tendency movement had significant impact on moral field, namely review of values, in the first place and consequently in the next place on the spread of public sensitivity and specialized knowledge to the consequences of human decisions in the different areas of environmental organization in the second half of twenty century. Environmental tendency literature was extended to the field of architecture from 1970s and its reflection in the architecture was associated with position reviewed in nature to design physical environment based on ecological principles and values. The so-called "sustainable architecture" on track to achieve "sensitive and responsive" architecture to environment. Sustainable architecture has social- political and moral- valuable commitment and it is a complementary component of a global participatory process that considered its result could achieve stable biological community (Portcous. 2002). Efforts on track to achieve more sustainable architecture in the last two decades of the twentieth century have been associated with various interpretations. In each of these tendencies, often emphasis on areas of ecological sensitiveness or truth of environmental sustainability and therefore has not a comprehensive view at the concept of ecological sensitiveness. For example, the term of "green architecture" often used in architectural approaches that have natural forces and environmental facilities in order to achieve efficiency and productivity of resources and providing internal environment comfort conditions, particularly in visual and physical relation to the nature.

In Echo-tech tendency, to create architectural spaces and to configure the environmental conditions, with help of modern technology modeling of how natural systems and functional characteristics work. Integrating ecology with technology can design buildings and cities with the minimum environmental damages. Accordingly, based on diverse range of sustainable architecture in the last two decades of the twentieth century and the beginning of this century, the main concern and focus, in order to response to environmental issues in these approaches have been:

Sustainable architecture	1	Formation toward benefiting from climate conditions
	2	Performance and efficiency
	3	Environmental health and hygiene
	4	Pollution caused by construction, operation and demolition of building on the environment
	5	The durability and stability of building
	6	Flexibility of architectural space in order to adapt to the needs
	7	Quality recycled materials and reuse capabilities
	8	Internal energy and return to the cycle of ecosystem
	9	Response to the environment from a holistic perspective

Table 2. sustainable architecture

Reference writers

In table 2, trends diversity in the late 1990s, in industrialized and developing countries, trends in the level of sensitiveness and ecological considerations has grown and sustainability was introduced as a category of "negotiable". (Williamson et al. 2002). These superficial trends in the sustainability literature have been raised with two so-called "green wash" and "culture wash" (Hagan. 2001). The first phenomenon, which is detectable in claims, is about "being green" or "friend of nature" or "being sustain" in certain products

and are discussed building materials and related equipment and technologies, and often these claims, are also associated with the official justification and credit, for example ecological label. Such superficial culture in architecture is introduced with the claim that this type of materials is "nature lovers" or "clean technology" and can alone guarantee in designing a sustainable building. (Williamson et al. 2002) Such single-dimensional approach with the concept of sustainability in architectural that confirms on design inclusiveness and integration is contrary. The weakness of such approaches, especially in practice is also clear, because many of matter and material claimed to be green, but in fact they impose great costs on the ecological environment when prepared (Same). The second phenomenon, which refers to application of materials, structural and formal elements and general characteristics of an index of an local architectural culture that can be converted as a part of an indigenous culture and guarantee of its continuity (Same). With review of this article can mention four main factors in the concept of "sustainable architecture" in the second half of the twentieth century:

- Recognition of the limited natural resources and materials, especially energy resources, fossil fuels
- Detection of adverse effects of environmental pollution caused by man-made environment on natural ecological balance (from macro to micro scale) and public health and limitations of understanding the natural environment to absorb and eliminate the pollutions.
- No identity in architecture and lake of space with emphasis on the "energy efficiency" and " standard tendency".
- "green wash" Perspectives in Sustainable Architecture, leading to use the apparent advantage of the architecture and the formal presentation that apparently claimed the architecture is stable.

However, some approaches are in the middle of this range that most of them is toward to using special methods for designing structural elements, spatial relations, pattern layout and how to set and how are environmental conditions that some aspects of environmental sustainability accountable .For example, solar architecture, efficient energy and climate with sensitivity to utilization of climatic forces and capabilities of climatic substrate design, text-oriented approaches with emphasis on local and indigenous identity in architecture or echo-tech tendency With emphasis on modeling from performance of the natural systems that are in this range. At the other end is placed an architectural range that its ecological complexity required for a comprehensive response to the issues facing architecture. This complexity represents a "universality" and "integrity" in an architectural solution. The aim is creation a dynamic interaction between the layers of social / cultural, natural and physical environment That is accountable to indigenous issues , environmental conditions, economic and cultural environment (Hagan.2001). In this perspective rather than a specific attitude or tendency in architectural design orientations may appoint, determine the stability of ethics policies are the main architectural.

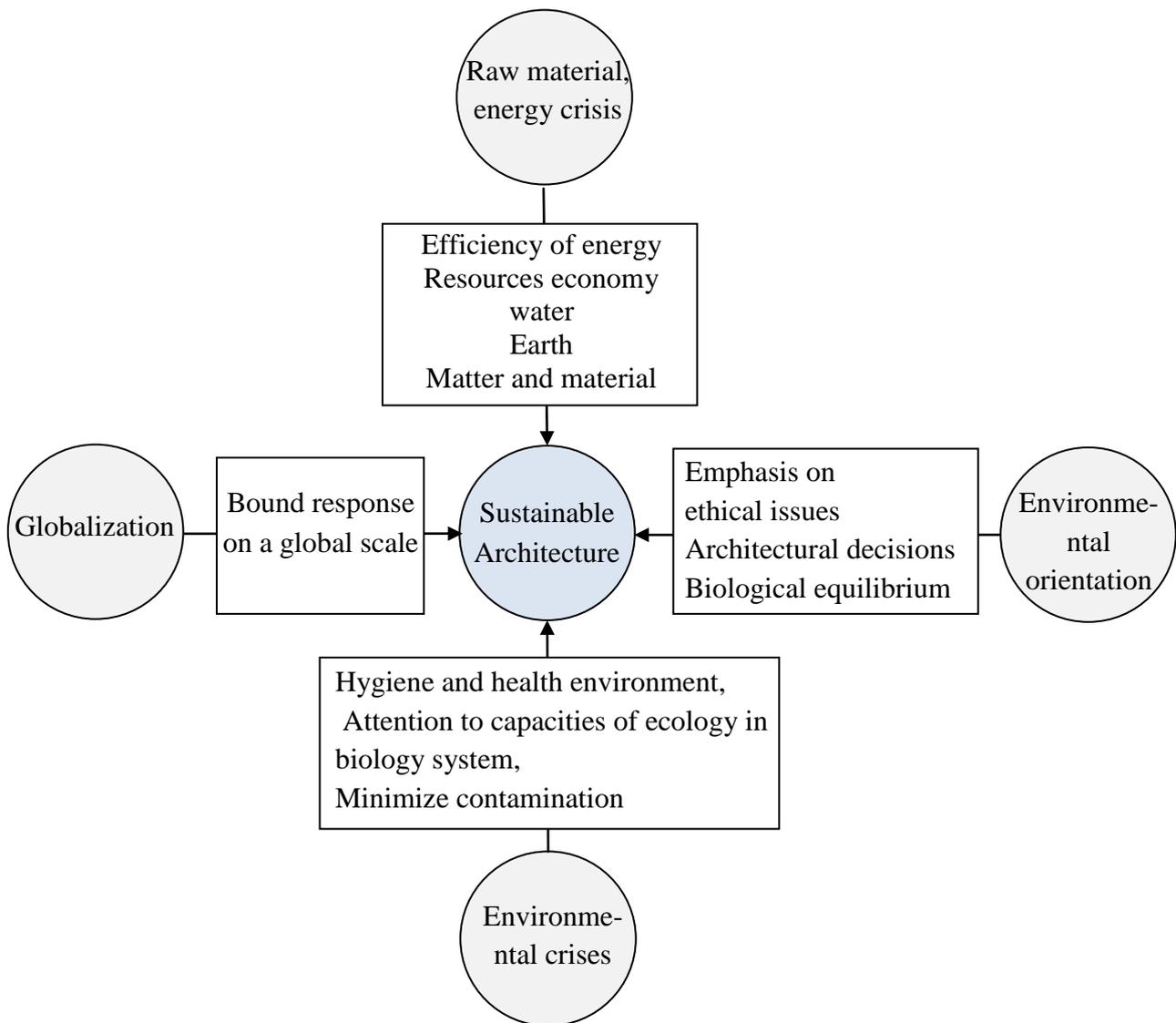


Figure 1: Factors Shaping and represents the approach to sustainable architecture

Conclusion

Although sustainability thinking as an approach of coexistence with the environment, is as old as the history of human architecture. However, sustainable architecture, as revised in case of modern architectural principles and approaches based on environmental moral system, is an approach that was expressed in the second half of the twentieth century and was used to responding Created numerous problems due to wrong decisions in the domain of the human environment. Thus, in studying the origins of this architectural approach, the route of review and development of modern architecture, architecture sensitive to the environment (Sustainable Architecture) was studied. From this study it was shown that although environment-sensitive design approaches has been followed before the term of sustainability in architectural design, but the trend of environmental, social, economical-political events of world after 1970s, in design of sustainable architectural term and developing environmental and architectural-sociological concerns is considerable globally. Finally, to achieve sustainability in all areas and especially in the field of architecture, we can conclude that stability alone does not result in architecture. Hence, sustainable

community is such as single chain that its rings are so important to achieve the main goal. Stability occurs when the entire rings of chain can be coordinated together. It appears that before reaching the objectivity of stable architecture, should be pursued its subjectivity and footprint. Because sustainability must first raised in the moral and behavioral area as part of the culture, values, and then implemented or reached to the architecture and its objectivity. Although change in the context of life style and attention to local and global environment is important, but creating the foundations of scientific knowledge that generating skills, techniques and methods of achieve to specific environmental objectives, is essential. Today, sustainable design in architecture has more scientific basis, than conscience and moral system basis. Enhancing environmental sustainability, each building should be three principle of sustainable design - the human design, saving resources, and design based on life cycle –observed in the holistic manner in the design, construction, operation, maintenance building, recycling and reuse of architectural resources. The principles , form conceptual framework for design of sustainable architecture. So architects with regard to such a framework instead of taking a set of ready solutions, can be used the suitable solutions.

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