



Sustainable Development and Positional & Approach Transformations of Architecture

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ABSTRACT

It seems necessary to include participation of different areas in architecture. The present paper deals with approach transformations and changes within the recent years and investigates architecture position with respect to sustainable development from qualitative and conceptual viewpoint, contrary to most previous texts which approached to the issue by quantitative views. The present research emphasizes on conceptual transformation in approach to housing architecture process and place in relation to environment and other areas involved in sustainable development. We came to this conclusion that within the current period, energy, power subject and information trade are considered as necessary items for new knowledge. Further, software is a mechanism for using energy and trading information. Therefore, architecture role in sustainable development and especially energy area is something beyond the importance of structure in internal housing heating and cooling and involves pre-structure and post-structure stages. This requires coordination with other managerial, social and cultural areas.

KEYWORDS: sustainable development, environment, approach, housing structure.

INTRODUCTION

Zigfrid Gidion (Gidion, 1975) refers to a fixed principle which is permanently present due to shape (form and geometry), spatial relationship (performance), technical aspects (structure and construct) and finally, social aspects (culture). Simple concept of architecture and housing structure is nothing but resultant of media and permanent presence of that principle which indicates power and authority for overcoming environment and application of resources for achieving comfort. To put it more simply, over thousands of years, housing architecture has meant more access and sovereignty over environment and environmental resources and in case of changes in conditions, presence principle and authority demonstration would not have changed but also media array (shape, performance and structure) would have changed (Gidion, 1975). Therefore, before sustainable development was propounded, architecture styles and history tended to domination over environment (nature) and wasteful use of energy resources. For instance, Renaissance transformations did not change construction method but it changed human place (Bani Masoud, 2004). Modern period discussions on form separation and performance which was propounded by Lwiss Salivan propounded challenges ahead of architecture media array and not giving priority to environment preserve principle. Even what is called as "organic environment" and Frank Lewidright was its pioneer, although it cared about internal and external and site (land) unity (Gidion, 1975), this unity also has less tendency to giving point to external aspect in its present concept but it emphasized mainly on structure of architecture. After energy crisis also changes in energy resources exploitation were mainly concentrated on material aspects and applied material in architecture structure. The reason for the mentioned ignorance was that there was no knowledge about the fact that exploitation of natural resources in different climates and geographical conditions involves different interests and different solutions. However, nature and all its facilities is a public demand (Gray and Hughes, 2001). One of the outcomes of such ignorance is inappropriate paraphrase of energy conservation law (conversion of energy and its remaining constant and not use of different forms of energy). Moreover, it gave priority to heating and cooling of architecture structure (with lesser cost and easier access) from among all aspects of energy including resources, optimization of costs and so on (Schiler and Kristan, 1994). From this viewpoint, which viewed power and power instrument in traditional form, architecture –and other areas- were considered as needless to coordination with other areas. Architecture process is summarized in structure and impact of architecture and areas, components, factors and other items were considered as subsidiary factors and did not have any special place and shape (Gray and Hughes, 2001). Sustainable development -which is an organizational principle in local to global decision-making and was resulted from the above issues- was a change in concepts approaches to different areas and especially architecture. Therefore, energy, power subject and information trade are necessary items for knowledge about the world and

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software are mechanisms for use of energy and information trade (BaniMasoud, 2007). The present paper tries to emphasize on sustainable development and report concepts of architecture process.

Sustainable development, concepts and definitions

The word “sustainable” means steady and long-lasting according to Dehkhoda Dictionary (Dehkhoda, 1998). In English, “Sustain” means support, maintain alive and continue.

Sustenance describes something which brings comfort and nutrition and satisfaction and results in sustainable life.

In sustainable development, the word sustainability means “what can be continued for a long time” (Mahmoudi, 2005). Sustainable development is a kind of development which considers future generation abilities besides present needs (Crowley, 1994). Sustainable development which was proposed in 70s in scientific forums can be considered as result of logical growth, new awareness about global issues, environment and development. Sustainable development also was influenced by environmental movements of 60s and the first UN conference on “environment and development” which was held in 1972 in Stockholm (Mahmoudi, 2005).

Sustainable development; backgrounds and instruments

- Climatic changes

Scientists unanimously believe that governments should accept climatic changes and increase in greenhouse gases. Geological studies reveal that climatic changes are increasing as a result of burning fossil fuels by humans (Boil, 2008).

- Fossil fuels

Since industrial revolution, industrial activities have increased greenhouse gases in atmosphere. Carbon dioxide is the main gas which contaminates atmosphere and is resulted from burning fossil fuels (Boil, 2008). Use nuclear and fossil fuels has had many adverse impacts which include air pollution, acid rain, consumption of natural resources and nuclear radiation dangers. Global climatic changes have led to dissemination of greenhouse gases resulted from fossil fuels combustion and this has caused sun energy to return to space in the form of infrared radiation and this results in a balanced temperature on the earth (ibid). if the earth did not have any atmosphere, its balanced average temperature would have reached -18 degrees centigrade but the atmosphere has greenhouse gases like water steam, carbon dioxide and methane which act like the glass of a greenhouse and this glass lets sunlight in but prevents from exit of infrared radiation. This natural greenhouse phenomenon controls earth surface temperature at an acceptable limit i.e. around 15 degrees centigrade (ibid).

Greenhouse gases

Climatic changes are the consequences of what is called greenhouse effect. Greenhouse gases prevent from sunlight radiation on earth and sunlight is absorbed by atmosphere. This produces heat and this heat is radiated back into atmosphere. Carbon dioxide & other greenhouse gases which are produced as a result of fossil fuels burning have changed earth climate very rapidly (Boil, 2008). Scientists believe that this radiation has increased earth average by 0.6 degrees centigrade in the 20th century. Further, if this is not stopped, earth temperature will increase by 1.4 to 5.8 degrees centigrade till the end of 21st century. Such an increase in temperature may increase the number of severe climatic variations like flood & drought & cause serious harms to ag...& ecosystems (Boil, 2008).

Emergence of ecologism & life world

The emergence of ecologism & life world had some consequences like bionic approach to different areas & layers. This means that although the nature is viewed from different aspects, it is a public asset for satisfaction of needs & changes in one aspect influences other aspects (Bani Masoud, 2007). Emergence of life world concept influenced architecture too. Contrary to early modern architecture pioneers who claimed sovereignty on society & its guidance via architecture, new approach made architecture to safeguard the nature as a partner & adhere to bioclimatic principles (Lamberts, 2003).

Sustainable development

Necessity for nature cycle continuation simple concept of sustainable development which has both warning & guidance use is nothing but a new approach to nature- oriented ness for cosmic durability (Bani Masoud, 2007). It is integration for living instead of infliction for living. Sustainable development means attempt for finding new knowledge about surroundings, specially nature & energy. This attempt is pivoted around the followings:

- Definition of human society & its aspects in dynamic form & also ecosystem in which evolution or disappearance of every element is related to other elements & therefore all layers & aspects of societies are involved in it.

- Nature is the only resource & capital of lifeworld & the trend of human life depends on collaboration on nature protection. From now on, powerfulness is defined by access to energy & protection of resources (Bani Masoud, 2007).
- Belief in this paradigm involves change in previous attitudes & approaches as well as redefinition of concepts. Therefore, information trade between different layers & areas is necessary for acquisition of new knowledge. For short, energy, power subject, information trade are necessary for new knowledge about the world. The main instrument for energy use & information trade is software & satisfaction of needs & demands & provision of comfort depends on accessible software smartness which is accessible (Lzamberts, 2003).

- Use of new & renewable energies:

A new approach emerged as energy crisis heightened & it contributed to thermal comfort in buildings without (or with minimum) energy waste (Sharma, 2003). This approach to new & renewable energies showed that renewable resources can play an important role in global energy in the second half of the 21st century (Boil, 2008).

Our ancestors first used fire as a biomass energy and actually used photosynthesis energy i.e. the process in which plants are grown by means of water, carbon dioxide and sunlight. Then, human societies used water and wind movement and energy (both of which are formed as a result of sunlight radiation on atmosphere and oceans) for grinding cereals, irrigation of crops and development of shipping and architects tried to make design buildings which use sun energy more than before and therefore reduced need for use of artificial light and heat (Boil, 2008).

Sustainable development and architecture

In search for solution

Housing architecture is based upon human innate tendency to acquire favorable and repel unfavorable things. New housing architecture tries to satisfy comfort with minimum cost and maximum access (Schiler and Kristan, 1994).

We develop our own solutions based on our personal skills and qualities for achieving our goals. What we do in a particular period needs a collection of instruments which are used for solving problems and we relax by them (Gray and Hughes, 2001).

Therefore, architects should change approach to previous conditions concerning energy. Of course, this change in approaches results in change in solutions (Gray and Hughes, 2001).

- Present status of architecture

From among the 6 plans and typologies of modern period architecture and urbanization, environmental planning which has roots in Howard's garden city and was mainly developed since 1960-1970 is a resultant of deep investigation of the importance of social and ecological factors of global development. Increase in environmental crisis resulted from global warming and climatic changes in the start of the 21st century are an emergent dimension of this solution (Walters, 2007).

Further, a comparison of the role of architect and other professional designers in the previous and present era reveals the following transformations:

Yesterday: architects and engineers dominated market and today, designing professions and redefined and new designers are emerged.

Yesterday: architects had powerful position in designing process but their power is diminished today and given to managers, other professional designers, service sector engineers and other engineers.

Yesterday, designing and creativity were aspects of architecture training and today, designing training is not based upon fixed skills which are not changed according to needs.

Yesterday, "real" problem designers specified employer but today specialized employers specify customers.

Yesterday, professionals tried to give a superior service designers are managed by others today.

Yesterday, professional designers were responsible for all process management. Today, different techniques are used for integration of design and structure. In other words, collaboration is important and application of software and adherence to standards takes place of individual actions (for a comparison between the present and past position of architects, refer to Gray and Hughes, 2001).

- New approaches to key concepts

By "new", we mean renewable and renewable energies are energies which are originated from sun and the sun is a sustainable and unlimited source of energy. The amount of energy produced by sun is infinite and is 5000 times greater than the present energy required by earth (Boil, 2008).

The sun is both a direct and indirect source of energy (like bioenergy or water or wind energy) and previous human societies have been based on sun energy (Boil, 2008). Using these resources, we can access health in housing. This subject has a long history and even 19th century reformists investigated diseases which are originated from weak structure and mass housing building (Towers, 2005). Housing health is a solution for sustainability while

sustainability does not mean "constancy" but it is a combination of material and meaning, quality and quantity, hallucination and performance for creating a desirable environment for the present and future. Sustainable designing is a combination of aesthetics, architecture, place sense, environmental considerations, economic considerations, individual and social considerations and adjustment to environment and deals with the question: how can architecture live in what it builds? (Lewiss, 2005). Recognition and analysis of environment aims to determine the most appropriate methodology for works and does not refer to a complete and ideal solution but it purely aims to make sure of what is built and what is the most acceptable coverage among cycles. In spite of this, as cycles are changed, complete project organization will also change (Gray and Hughes, 2001).

Finally, it must be said that we are not only users but also protectors of main energy resources (earth and sun). the earth and the sun cannot be repeated nor replaced. Therefore, use of energy considerations in architecture plays an important role in maintaining energy resources.

Conclusion

Limitation of natural resources makes architecture (as the most tangible human action in relation to the nature) is responsible for doing the followings:

1. it must use solutions which are directed at maintenance of resources.
2. it must consider backgrounds, components, factors and other items before structure and estimate the impacts of architecture structure on the nature.
3. every architecture action must be taken in coordination with other areas and must not be taken alone.
4. now, the main criterion for judgment about architecture is its adherence to environment protection necessities.

All these transformations are influenced by change in approach to items like "memorandum", "residence", "comfort", and "living" because the trend of the contemporary period is nothing but new knowledge about the world and especially the importance of two main life resource i.e. the earth and the sun.

Further, efficiency, strength and beauty of architecture have an inseparable link with the type of attitude towards the two resources.

REFERENCES

- Bani Masoud, Amir (2007). Post-modernism and architecture; investigation of thought schools and contemporary western architecture. Isfahan: Khak Publications.
- Bani Masoud, Amir (2004). History of western architecture; since ancient age till Chicago School. Isfahan: Khak Publications.
- Boil, Gadferi (2008). New energies. Translated by AbdolrahimPartovi. Tehran University Publications.
- Crowley, Angela(1994). Oxford elementary dictionary. Oxford University
- Dehkhoda, Ali Akbar (1998). Dictionary. Edited by Mohammad Moeen and JafarShahidi; [under supervision of] Dehkhoda dictionary institute. Tehran: Tehran University, Rozaneh printing and publication institute.
- Gidion, Zigfreid (1975). Architecture, you and I. Translated by Akbar Mir Motahar. Tehran: Zar Publications (second printing).
- Gray, Colin and Hughes, Will (2001). Building Design Management. UK; Oxford; Elsevier)
- Lamberts,,Roberto (2003). Bio Climatic Buildings. Federal University of Santa Catarina)
- Lewis, Sally(2005). Front To Back: A Design Agenda For Urban Housing. Oxford: Elsevier.
- Mahmoudi, Mahnaz (2005). Fundamentals of sustainable design directed at targets of sustainable development.
- Sharma(2003). Thermal Comfort and Heritage Building. IE (I) Journal.AR Vol 84, June 30, 2003
- Schiler, Marc and Kristan, Ryan;(1994). 3,000 YEARS OF PASSIVE SOLAR ARCHITECTURE IN A HOT ARID CLIMATE() School of Architecture University of Southern California Los Angeles)
- Towers, Graham (2005). AT HOME An Introduction to Urban Housing Design; AT HOME IN THE CITY. Architectural Press An imprint of Elsevier)
- Walters. David(2007). DESIGNING COMMUNITY: Charrettes, master plans and form-based codes. UK; Oxford; Architectural Press is an imprint of Elsevier)