Indicators of Sustainable Architecture in Third Millennium

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ABSTRACT

Since the architecture reflects the extract of time-place during the history, this course should pass the evolution and transformation due to the importance of science and technology in the present era by relying on science and understanding of the day and somehow reflect the extract of the new era that is technology. The subject is the reconciliation between technology and nature. In the present millennium the global concerns and worries toward the environmental issues and the crisis of energy resources and finally worrying about the low quality of the life in next generation and the third wave of changes in technological improvement and communication, genetics, artificial intelligence, robotic and digital science which are created in the modern world of technology such as IBMS, Parametric Design and IMBP which otherwise welcome a new revolution in architecture design using the last technology for environmental goals to reduce using irreproducible sources and improving the usage of reproducible sources and preventing the environmental pollution and destroying natural and national sources of the country and finally destroying the environmental systems and lowering the quality of life by considering the future generation and this is a must. In this research it is tried to review the results of the study on climate strategies in classical architecture and also new changes in sustainable architecture and also scientific and technical improvements in the fields related to architecture and controlling the reproducible energy sources and express the main strategies based on a new trend in sustainable design of the architecture in third millennium.

INTRODUCTION

Sustainability is one of the most important issues in the world today which is significant in social and human environmental dimensions. Recent changes and developments in last decades caused fast development in developing the science and had improper consequences for environment.

For example, nano technology is the ability to make objects from atoms (Akhavan and others, 2002). Building material loses their fixed identity and buildings will be able to adjust with different climates, temperatures and architectural concepts (Olson, 2000, 993-998). On the other hand, the building nano technology industry is without energy and time loss, side effects and pulps and in fact is compatible with environment and gives an ideal future to the architects (Abassalipour, S., 2008).

General principle of sustainable Architecture:

Table 1: the general principles of architecture

<table>
<thead>
<tr>
<th>goals</th>
<th>solution</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy of Resources</td>
<td>Proper use of reproducible energy to reduce consumption</td>
<td>using the materials and energies in the district</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- using local material as much as possible(Tcpa=66:2006)</td>
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<td></td>
<td></td>
<td>- using low demanding facilities</td>
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<td></td>
<td></td>
<td>- saving water and energy (Tcpa=46:2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Using local plants as much as possible</td>
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</tbody>
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**Controlling and applying the natural sources**
- using active and passive systems
- design compatible with climate
- using replacing sources of reproducible energy
- using pure energies (Tcpa-26:2006)
- using natural cooling and heating sources (Tcpa-22:2006)

**Before construction**
- least use of fossil fuels in building constructs
- using material without harming the environment
- Using reproducible materials
- using recycled material (Tcpa-26:2006)
- using materials with longer life duration

**While building**
- minimizing the costs by reducing the complications in the space and engine house
- respect for topology
- preventing sudden entrance of heavy machines and avoiding damage to the environment
- Using non-toxic materials
- separating the pulps
- mixing the construct with facilities

**After building**
- least use of fossil energy
- reducing the costs by control the quality of the material and using reproducible materials
- recycling the elements of the building
- using the constructs again
- maintenance
- reviving the monuments
- flexibility of the usage
- replacing the old material and not using the chemical materials

**Maintain environmental resources**
- preventing change in the environment
- respecting the topographical curve
- not mixing the water beds
- maintaining vegetation
- preventing damaging activities (Tcpa-29:2006)
- paying attention to the efficiency of environment
- flexibility of the environment
- not analyzing the existed sources
- recycling the materials
- not using polluting materials
- paying attention to development capacity

**Urban and site design**
- localizing the uses
- supporting multi-dimensional activities (Tcpa-24:2006)
- local viewing
- combining design with international transportation creating different activity centers
- considering the place capacity for selecting the location
- considering the environment capacity
- Ease of compatibility and flexibility
- Efficient planning thorough simple and modular design
- providing the possibility to change the plan and internal spaces
- maximizing the usable spaces through reducing the channels and fake ceiling

**Designing the facility**
- providing thermal facilities and modifying the humidity
- visual and audio communication with environment
- providing windows with ability to modify the temperature
- providing pure and fresh air
- considering people with different abilities
- combination with nature and views
- providing standard physical needs of the visitors
- making access through pavements
- considering place capacity to include the population
- effective and predictable curs
- proper movement of visitors

(Source: processing the information of the author based on the principles of sustainable design, Architecture College of Michigan University)

*Architecture of the third Millennium:*

By changing the views about the architectural activities in the book of architecture for a sustainable future is described as below:

It is expected that the architecture of the 21st century to have all the professions environmental engineering, geology, soil mechanic, view architecture, history, urban planning) and use the combination potentials and experiences to be able to design the buildings in different dimensions and apply them in practice.
During the history, most attention is given to the forma and appearance. Mostly, if these views are studied in the present century, we kind of feel that these views are affected by conditions such as facilities and changes tools.

**Theoretical bases of third millennium architecture:**

According to most of the scholars, the ending years of the 20th century were a new era in the history of human being where technology and specially the information technology was strongly forming the social constructs and then effect all the global phenomenon including economic, teaching and culture. Architecture is one of the main social-human phenomenon and has not been away from the global changes and transformed so that it has been completely different from classical ones.

**Table 3-3: changing the views about architectural changes of third millennium activities**

<table>
<thead>
<tr>
<th>Architecture features of the new century</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. space is not only created by the mind of the architect but it has a life of its own and if the author</td>
</tr>
<tr>
<td>is the beginner of piece, piece is beginner of the author</td>
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<tr>
<td>2. various software made a new relationship between new architecture and environment</td>
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<tr>
<td>3. Concept in architecture is a primary idea which leads all the next stages have complicated dimensions</td>
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<td>4. in a peace process is more important than the results and if the beginning of the process is with</td>
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<td>the architect, the next process depend completely on him</td>
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<tr>
<td>5. innovating the design methods is a part of innovation in architecture</td>
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<td>6. Form is not a function of performance and performance is not a function of form. Form follows a</td>
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<tr>
<td>process for production which does not necessarily in direct relation with architecture. Form is the</td>
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<tr>
<td>results of the tension existed between logic and cognition.</td>
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<td>7. Architecture does not stand against the nature and does not have any tendencies to overcome the</td>
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<td>nature but in fact one is processed in another one.</td>
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<tr>
<td>8. any kind of duality in material and space, inside and outside, up and down, ordered and disordered</td>
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<tr>
<td>do not have any value and architecture is the results of a continuous tension among them</td>
</tr>
<tr>
<td>9. Architecture cannot be analyzed into its building blocks and surface, floor, ceiling and wall are</td>
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<td>devoted to logical architecture.</td>
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<td>10. Criticism and architecture are necessary for each other and criticism of architecture is a part of</td>
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<td>it.</td>
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Architectures who justified their activities in form of art faced the new views. The sustainable architecture considers the science and art as complementary. Information technology and mass media will change the design methods seriously.

**Main principles used in modern architecture of 21st century:**

![Diagram of main principles](image)
Sustainability goals in the project:
1. Designing based on climate condition
   • Following the principles and design strategies based on sustainable architecture
   • Local forms are studied as forms based on climate condition
   • Using Ecotect software

2. Use of renewable energy
   • Integrated Photovoltaic System Trym
   • Passive systems to control wind and solar energy
   • Removable shell systems to control wind and solar energy

3. Versatile and flexible performance
   • atrim
   • Multifunctional Gallery
   • Multi-purpose open spaces.
   • Multi-purpose hall rally

4. The use of innovative technologies in keeping with sustainability goals
   • Nanotechnology
   • IT (Information Technology)
   • IBMS (Intelligent Building Management Building)
   • Design para-metric

Conclusion:
Environmental problems and reduction of energy sources happen due to industrialization since the last century of the second millennium and lack of information about it and big changes in different branches of science and technology and producing science welcome a new way in getting the concepts and new methods of architecture design. So, it is concluded that by using the achievements of the second millennium, we can have maximum avoidance of pure and not limited energies and then use the fossil fuels which pollute the environment.

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