

Review Paper on Sustainable Architecture.

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ABSTRACT

Sustainable Architecture can be looked at as two different branches of thought which affect one another. One branch is an evaluation of the impact of current building materials/ use of energies, and finding better socio-ecological solutions (green building), the other branch is rethinking the way in which we may imagine architecture from the beginning, using the instance of “architecture.”

Sustainable Architecture is inclusive topic in which many different concerns such as design, materials, use of energy, cost, and the environment, are weave together in the interest of creating a functional structure which meets the needs of the present without compromising the ability of future generations to meet theirs.

Like many of the innovations in sustainable living, architecture has come at a time when the need is great. Population growth is an ever-pressing issue, which limits building materials and energy use, as well as space. This forces architects to rethink their design in terms of its impacts on multiple systems, thus making the challenge of creating sustainable architecture a difficult one.

Many advances in design and alternative building materials are being made, which greatly reduce the costs of building and maintaining a structure, as well as the environmental impact. These methods are extremely important if we are to create true sustainable architecture. Currently, most of the materials we use to build our homes are hazardous to our health, and the building process creates an enormous waste, which makes up a huge percentage of our landfills. By rethinking the design from the beginning, reusing building materials, and using alternative materials, this waste could be greatly

reduced, as well as raising efficiency and the condition of our own health.

INTRODUCTION

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Objectives

- 1 To bring out the importance of biological patterns and bio-materials for architecture on different scales and levels of designs.
- 2 To consider the biological basis of human perception and behavior, the ways to satisfy the needs and demands associated with them.
- 3 To present new possibilities and new scopes in restructuring urban and agricultural areas, as well as human settlements in general, in accordance to bio political principles.
- 4 To introduce the nation Bio polis as optimal strategy leading to the realization of bio-architectural patterns.

LITERATURE REVIEW

ENHR 2007 International Conference 'Sustainable Urban Areas' (International conference 25 to 28 June 2007)

Environmental impact of human activities, pollution, overpopulation, widespread Infrastructure deterioration, natural resource depletion and waste generation are some of the reasons that make sustainability as an essential approach in contemporary world. Vernacular architecture and urbanism of Iran has many characteristics of sustainable architecture and studying its space helps to the future development as a successful space in the heart of the city.

Tabriz has been the capital city of Iran many periods. Its Bazaar has different spaces and its strong connection to open space is remarkable in its design. It is so much related to the climate of the city as Tabriz is located in cold climate of the country and the materials and architectural form of this space response to the nature and context of the city. This space shapes a sustainable place which different aspects such as social, economical and environmental sustainability are considered in it.

European Journal of Social Sciences – Volume 18, Number 4 (2011) by Nura S. Mohamed and Zuhairuse MD Darus.

To build a green environment with the methodology, it must be valid on a comprehensive approach for the design of buildings appropriate to the environment. And all natural resources within the designs of any building materials such as natural or synthetic materials, and the contribution of users should be viewed as sustainable architecture. And giving the production of green buildings include solving many issues about the construction and the environment and conflicting requirements, every decision of design and environmental impact implications, The "green" buildings and construction of a high priority on the environment, health and conservation of natural resources and have more impact on the life cycle.

Used Material Efficiency

Green architecture observes these materials properties regarding the lack or reduction in elaborated elements or harmful gases and a decrease in their toxicity. It also observes the possibility of recycling, their disintegration resistance, predicted life and possibility of local production. It suggests use of materials produced from removal and destruction because they contain chemically inactive materials. It also suggests use of dimensional planning which depends on repeated measurements and decreases in cost by the use of

fewer materials. It also requires enough space to implement programs to get rid of solid wastes, to recycle destructive wastes, to include a special time to gather recycled wastes.

Health and Safety of Building Users

Paper researches have shown that buildings which have a well-painted inside environment may lower the incidence of hypersensitivity asthma and resultant diseases due to building effects that include chemical elements or products of petroleum and petro-chemical derivatives that have a toxic effect on humans. Some of them affect the brain directly, while others affect the immune system, and consequently prevent the destruction of disease.

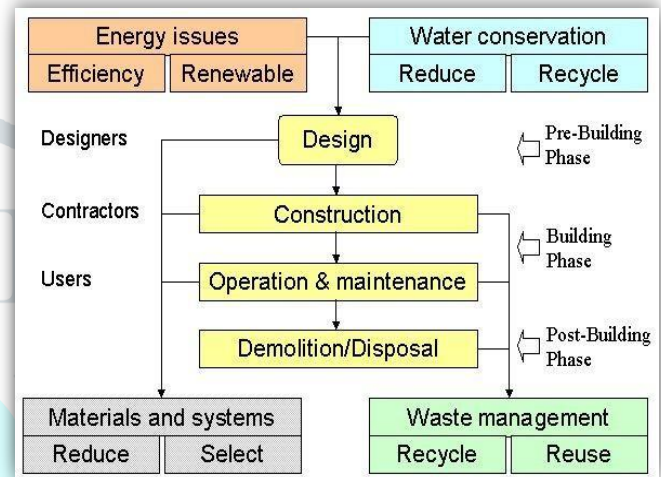
Improvement of the inside environment leads to better efficiency and quality of workers performance. Advantages of this exceed cost from 8-14 times. Construction and painting materials should not emit elements affecting the inside atmosphere. Many materials of construction, maintenance and cleaning emit toxic gases, such as volatile Organic Compounds (VOC), which come out from gypsum bars or their adhering materials, especially during first stages directly after fixation. Ventilation and warming leads to the quick drying of gypsum and the emitted elements are lowered considerably by treatment of gypsum surfaces by painting. These gases have bad effects on the building user's health and production. As a result, recycled gypsum is preferable, as are adhering materials which depend on adhering papers and not adhering fiber-glass. Use of water-saturated sponge decreases dust particles in the inside environment if used as an alternative to sand.

METHODOLOGY

Sustainable construction is defined as "the creation and responsible management of a healthy built environment based on resource efficient and ecological principles".

Sustainably designed buildings aim to lessen their impact on our environment through energy and resource efficiency. It includes the following principles:

- minimising non-renewable resource consumption.
- enhancing the natural environment.
- eliminating or minimising the use of toxins.

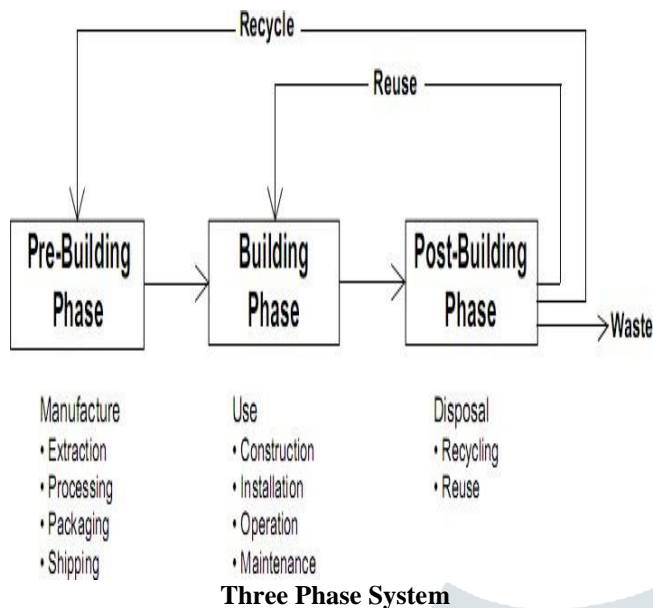


Process of System

Three Phases of Building :

Pre-Building Phase

The Pre-Building Phase describes the production and delivery process of a material up to, but not including, the point of installation. This includes discovering raw materials in nature as well as extracting, manufacturing, packaging, and transportation to a building site. This phase has the most potential for causing environmental damage. Understanding the environmental impacts in the pre-building phase will lead to the wise selection of building materials. Raw material procurement methods, the manufacturing process itself, and the distance from the manufacturing location to the building site all have environmental consequences. An awareness of the origins of building materials is crucial to an understanding of their collective environmental impact when expressed in the form of a building.



Building Phase

The Building Phase refers to a building material's useful life. This phase begins at the point of the material's assembly into a structure, includes the maintenance and repair of the material, and extends throughout the life of the material within or as part of the building. Construction: The material waste generated on a building construction site can be considerable. The selection of building materials for reduced construction waste, and waste that can be recycled is critical in this phase of the building life cycle.

Post-Building Phase

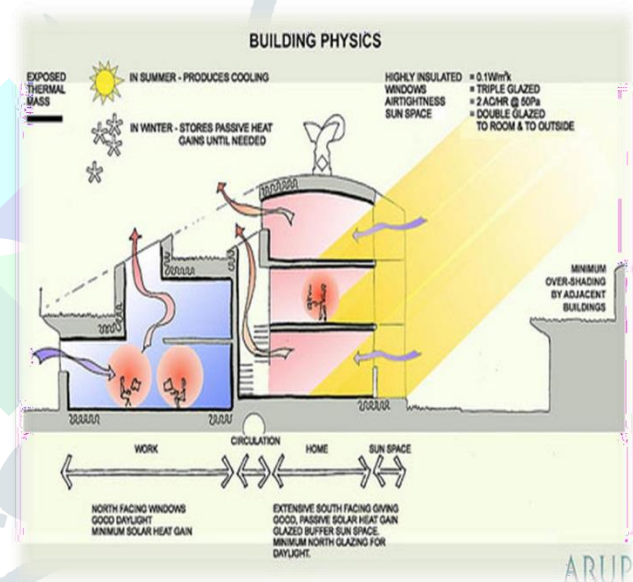
The Post-Building Phase refers to the building materials when their usefulness in a building has expired. At this point, a material may be reused in its entirety, have its components recycled back into other products, or be discarded. From the perspective of the designer, perhaps the least considered and least understood phase of the building life cycle occurs when the building or material's useful life has been exhausted. The demolition of buildings and disposal of the resulting waste has a high environmental cost. Degradable materials may produce toxic waste, alone or in combination with other materials. Inert materials consume increasingly scarce landfill space. The adaptive reuse of an existing structure conserves the energy that went into its materials and construction. The energy embodied in the construction of the building itself and the production of these materials will be wasted if these "resources" are not properly utilized.

Heating/Cooling

Heating and cooling buildings contributes to more energy usage than any other aspect of a buildings use ("Heating & Cooling"). Creating a building that is well insulated will reduce the energy costs of heating (and cooling) and will be looked at in the materials section.

There are many methods to keep buildings environment comfortable while minimizing energy input including: roof ponds, thermal mass walls, solar chimneys, solar rooms and green roofs. As a result of the lack of energy input these methods require, they are often called passive heating and cooling.

All methods of passive heating and cooling rely directly on the sun for energy input. Due to this reliance on the sun one of the most important aspects of a building is its solar orientation. A building that is shaped like a rectangle (with side lengths



Heating and Cooling of Building.

Conclusion

We have designed our house with a consciousness to several aspects: atmosphere, longevity, energy, interface and equity. We wanted an atmosphere that was comfortable, peaceful and conducive to living. We believe we have achieved this by day lighting, and providing indirect diffuse lighting. We have created an open space that allows for easy access to all the rooms. Air quality is kept fresh with plants, filters and mitigation techniques.

The building will last untold years as long as it is maintained. Made of materials that are built to last and once not needed can be recycled for further use, we have created a space that

materially has much less impact than a traditional building.

Because most of our heating and cooling will come from passive methods (direct solar) or ones that use little energy (radiant-flooring) energy used for maintaining the building temperature will be kept to a minimum. The overall embodied energy of the building will be much lower than a traditional building due to the use of primarily recycled and waste materials. The materials we have chosen also have the benefit of being local, further reducing transportation energy costs.

It saves money. It improves the quality of life, not just for employees, but everyone in the local and global community. It can make things more aesthetically pleasing. It makes an office more efficient. It helps sustain life on this planet and conserves resources for future generations

House, 601 West 13th

Northwest Energy Efficiency Alliance
http://www.nwalliance.org

8. <http://www.lib.berkeley.edu/ENVI/GreenAll.html>
UC Berkley's list of references for green building
9. <http://www.architect.org/institute/programs/sustainable/>
10. Compares the conventional vs. ecological approaches to ecological design, and has an extensive bibliography of green architecture books.

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