Need for Sustainable Architecture

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Abstract

The paper detailed the concept of sustainable architectural design that has come to the forefront in the last 20 years. At the beginning of the environmental revolution damage to the natural system became a main concern. This concept recognizes that human civilization is an integral part of the natural world and that nature must be preserved and perpetuated if the human community itself is to survive. However terms such as sustainability or sustainable development became more often mentioned only during the last decade, due to scientific evidence that excessive exploitation of natural resources in parallel to the ever-growing polluting agents would lead to irreversible environmental destruction.

By providing an awareness of the environment, values are taught that are necessary for the protection of the environment .From the study relating to Sustainable architecture and its relation to sustainable development, this paper identifies the principles of sustainable architecture and planning and clarifies the role of the public and professionals in reducing the impact of buildings on the environment.

Keywords: *Concept, Principles, Sustainable, Eco friendly materials, Sustainable architecture, Sustainable development, Eco friendly design, Design methods.*

INTRODUCTION

Sustainable Architecture refers to both a structure and the application of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle, from planning to design, construction, operation, maintenance, renovation, and demolition. The idea of sustainability is to ensure that our actions and decisions today do not inhibit the opportunities of future generations. Is it also seeks to minimize the negative environmental impact of buildings by efficiency and moderation in the use of materials, energy, and development space and the ecosystem at large. Sustainable architecture uses a conscious approach to energy and ecological conservation in the design of the built environment.

THE ECOLOGY

The Ecology is the science that seeks to describe and explain the relationship between living organisms and their environment and also deals with a scientific study of the interactions between organisms and their environment. We can say in very Simple words "Study of the "house/environment" in which we live". Ecology comes from the Greek words "Okio"-means house and"Logia"-means study of life. Ernst Haeckel, a German zoologist coined the term Ecology in 1866, after that Danish botanist, Eugenius Warming elaborate the idea of Ecology.

Ecosystem is a dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit. Every element of the environment have their own ecosystem. A dynamic ecosystem makes the balance of nature.

Ecological Crisis

The status of Eco System in the Past was Calm and Quite and human don't disturb the nature Ecosystem had been going on its natural cycle. But today the present status is totally in negative effect due to population increase and Ecological Crisis. The main causes of Ecological Crisis are Over Population, Environment Pollution, deforestation and destruction of natural resources. This resulted in Greenhouse effect, global Warming and climate Changes. The biggest way in which we are doing this is by contributing to carbon dioxide emissions.

Carbon dioxide is a gaseous product of burning fossil fuels like gas and diesel. This gas gets trapped in our atmosphere, creating a "greenhouse effect" that warms the Earth over a long period of time

Resource consumption in building construction

The materials used in building construction have a serious impact on the environment. There is a huge environmental impact associated with the extraction and consumption of raw materials for the use of building materials. Construction projects around the world have a significant impact on our environment, both on a local and a global scale. Every stage of the construction process has a measurable environmental impact.

The mining processes used to source materials, the transportation of these materials to the building site from sources around the world, the construction process itself and the waste removal and disposal process that follows the completion of the project. About 40–50% of total energy cost in developed countries is closely linked or is a consequence of building construction.

Need For Sustainable Architecture

The Main Reasons to adopt sustainable concepts in Architecture is, firstly, everybody wants to live in Buildings with good facilities. We live in houses, we travel on roads, we work and socialise in buildings of all kinds. Contemporary human civilization depends on buildings and what they contain for its continued existence, and yet our planet cannot support the current level of resource consumption associated with them. As a result we are in the position to adopt for alternative methods to reduce the resource consumption to save our earth from us. So it is clear, without any doubt sustainable Architecture is the only approach to provide alternative solution to the present situation.

The main reasons for the Need of Sustainable Architecture

- Increase of population day by day
- Migration of people from rural to urban areas
- Destruction of natural resources
- High energy and natural resources are consumed due to huge population.
- Effect on bio diversity
- Climate Change and Green house Effects
- Imbalance in Eco System

Any sustainable building should be able to

- Make the most of energy resources and natural capital;
- Support a part of its energy demand through natural processes;
- Use of renewable and local materials
- Reduce its influence on the water cycle
- Reduce CO2 emissions and waste production
- Become part of the surrounding environmental, Historical and cultural context.

Sustainability of Building Materials

Bricks

Brick, a sustainable product, Brick is a natural, quality, user and maintenance-friendly product, that is durable during all phases of its life cycle. When a brick building is demolished, sound bricks may be cleaned of mortar and reused. Brick waste can be crushed and used for landscaping. Brick and mortar waste can also be used as on-site fill.

Steel

Steel is a uniquely sustainable material because once it is made it can be used, as steel, forever. Steel is infinitely recycled, so the investment in making steel is never wasted and can be capitalized on by future generations. ... The investment of resources in making steel is not wasted because steel is not consumed.

Glass

Glass is a resource efficient material which is made of abundant natural raw material such as sand and glass waste (cullets). Glass is a fully recyclable material that can be recycled in close loop over and over again.

Concrete

Unfortunately concrete is not an environmentally friendly material, either to make, or to use, or even to dispose of. To gain the raw materials to make this material, much energy and water must be used, and quarrying for sand and other aggregates causes environmental destruction and pollution.

Plastics

It is better to use fewer amounts of Plastics in projects. Chlorinated plastic can release harmful chemicals into the surrounding soil, which can then seep into groundwater

or other surrounding water sources and also the ecosystem. This can cause serious harm to the species that drink the water. Landfill areas contain many different types of plastics.

During the Reuse of plastic it is Expensive to Recycle. ... In addition, the energy required to transport and recycle certain plastics often exceeds the cost to make products, so many plastics aren't recycled. This leads to millions of food packaging containers and plastics wastes being sent to landfills each year.

PVC

PVC (polyvinyl chloride) compounds are 100% recyclable physically, chemically or energetically. After mechanical separation, grinding, washing and treatment to eliminate impurities, it is reprocessed using various techniques (granulated or powder) and reused in the production.

Plywood

Plywood is an engineered wood product made of thin layers of wood glued together. Rotating the direction of wood grain in each layer gives plywood panel's good strength. The environmental profile of plywood depends on that of its ingredients wood and glue. It is always better to choose certified plywoods. Some plywood companies involving in great level of balancing the resources by giving back to the planet by planting millions of plants in Indian forest areas.

Rubber

For many years, rubber was considered a waste material that had little economic value or use. Produced mainly as car tires, rubber had a limited shelf life in terms of its usefulness and once that was over, it dominated landfills and other ecosystems. But Now we know that rubber can be used in many ways and purposes. It can be used and re-purposed for protective gear. It can be used to pave roads and bridges. It can be used to create fibers for clothing and outerwear. Rubber has many uses and coming to terms with that makes rubber and recycled rubber products a valuable sustainable material.

Methods to Achieve Sustainable design

Less is More, Small is good: it is better to built small and use of minimal spaces for various activities will help to reduce the cost of construction as well as the amount of energy and resources consumed from the source also reduced in a larger scale.

Use the Solar Energy: To produce current, for Heating and cooling needs, use the solar energy for daily usage to run water

heater, lamps and fans in houses. Without any doubt it is advised to use solar energy in buildings are constantly required.

Use the Natural Light :Design the Building in such a way that to get Natural lighting throughout the Daytime by proving larger opening and more open spaces around the building to avoid electricity usage as well as to get natural benefits to human health from sunlight.

Use local Material: locally available materials are majorly reducing the cost for transport and also very less impact on its environment with respect to the transportation.

Energy Efficient design: Use Energy Efficient techniques in site planning, orientation, Site micro-climate, Energy conservation, Passive solar heating, Passive cooling and natural ventilation, Day lighting, Renewable resources etc..

Use of natural materials: It is advised to use natural materials wherever possible to reduce the carbon foot print on the earth.

Wind catching elements: It is not practically possible to build big Wind catchers for all houses. But it is possible to provide more clearstory windows, ventilators and open courtyards wherever possible.

Conserve water: By providing quality fittings, install rain water tanks and recycle the waste water, Install trees and plants around your building, balconies and windows areas. The basic idea behind a rainwater harvesting system is to capture water to irrigate your garden and sometimes to use in the home.

Grow your food: Grow your food in roof terrace, and open areas in the plot.

Green roof

A green roof can lower the temperature in your house, improve local air quality and help add green space in urban areas where concrete is the major material. Green roofs can be as simple as a couple of types of ground cover or include a beautiful mix of moss, succulents, ground cover, and even herbs and plants.

Cob houses Cob is an ancient building material that's basically wet earth and straw mixed together and rolled into loaf-sized pieces or cobs. The mixture is very similar to clay, and what makes cob houses unique and beautiful is the organic shape.

Vernacular Architecture style

Buildings which are designed based on local needs, availability of construction materials and reflecting local traditions. This style encouraged with great importance on sustainable Architecture.

CONCLUSION

It's time to think "form follows environment" rather than "form follows function"

It is the responsibility of each and every Architects and Engineers worldwide, has to consider the environmental impact of buildings and impart the sustainable concepts, green building idea in their projects and create awareness to their clients. Because all the natural things which makes life possible on the earth includes under an environment like water, air, sunlight, land, fire, forests, animals, plants, etc.

It is considered that earth is the only planet in the universe having required environment for the life existence. Without environment we cannot guess life here so we should keep our environment safe and clean to ensure the life possibility in future. It is the responsibility of each and every individual living on the earth worldwide. Every professional should come forth and join the campaign for environment safety by adopting sustainable ideas in their projects.

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