

Green Library Buildings: A Sustainable Process

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Abstract

Due to the rapid growth of technology, we have reached the tipped point where we can re-invent and revamp administrative structures. Green buildings are also one of the creations of modern architectures that are widely used in latest technologies. US based LEED and Indian based IGBC are accredited with their rating scale to show how modern buildings are constructed as eco-friendly with the nature. Library and librarian are directly related to the society, they should not harm our nature but they should play as role leader to save our natural environment. This paper deals with what green library building is, how they are accredited, what are the things required for, and also what is the future of Green Library Buildings in our modern India.

Keywords: LEED, IGBC, Green Library Buildings, Sustainable Process.

Introduction

This world is very beautiful creation of God. Earlier it was green everywhere. In green forest varieties of animals, insects, respiratory, mammals were found. Population of human being are increasing day-by-day and for the survival of human beings, greenery of these forests is decreasing. Continuous destructions of natural resources have taken place in the form of natural disasters like earthquake, flood, and change in climate, tsunami and man-made disasters etc. We, human beings are the civilized being and we should use different types of techniques to preserve our resources. Numbers of awareness programme are organized by different types of institutions, Government bodies, social organization, NGOs for the sustenance and protection of our environment. Water pollution, air pollution, climate change, soil erosion, loss in energy etc. are the major problems in our earth, and because of these problems different types of disasters occur on our environment.

Modern architectures are using latest technologies to construct modern buildings as energy efficient or eco-friendly building so that buildings do not harm the natural environment but become capable to preserve the environmental entities and based on these techniques a library building can be exist. According to **Wikipedia** “a green library is designed to minimize negative impact on the natural environment and maximize indoor environmental quality by means of careful site selection, use of natural construction materials and biodegradable products, conservation of resources and responsible waste disposal”. LEED as an international council for rating the green buildings all over the world and IGBC rates buildings in India.

LEED

United States Green Building Council (USGBC) developed Leadership in Energy and Environmental Design (LEED) rating system in the year 2000 to help building owners and operators to be environmentally responsible and to use resources efficiently. From 1994 to 2015, LEED grew from one standard for new construction to a comprehensive system of interrelated standards covering aspects from the design and construction to the maintenance and operation of buildings. LEED also has grown from six volunteers on one committee to 119,924 staff, volunteers and professionals. LEED standards have been applied to approximately 83,452 registered and certified LEED projects worldwide, covering around 13.8 billion square feet (1.28 billion square meters).^[4]

Under LEED Buildings can qualify for four levels of certification:

Points	Certificate:
40-49	Certified
50-59	Silver
60-79	Gold
80+	Platinum

IGBC

Indian Green Building Council (IGBC) was formed by Confederation of Indian Industry (CII) in 2001. They are continuously striving towards wider adoption of eco-friendly and green building concepts in the Indian industries. The Confederation of Indian Industry (CII) – Green Business Centre building in Hyderabad is one of the green buildings in India. The vision of the council is, "To enable a sustainable built environment for all and facilitate India to be one of the global leaders in the sustainable built environment by 2025".

The council is committee-based, member-driven and consensus-focused. All the stakeholders of construction industry comprising of architects, developers, product manufacturers, corporate, Government, academia and nodal agencies participate in the council activities through local chapters. The council also closely works with several State Governments, Central Government, World Green Building Council, bilateral multi-lateral agencies in promoting green building concepts in the country.^[5]

Green building rating brings together a host of sustainable practices and solutions to reduce the environmental impacts. Green building design provides an integrated approach considering life cycle impacts of the resources used.

An important development in the growth of green building movement in India is the launch of the following IGBC Green Building Rating Systems:

- IGBC Green New Buildings
- IGBC Green Existing Buildings
- IGBC Green Homes
- IGBC Green Residential Societies
- IGBC Green Interiors
- IGBC Green Healthcare
- IGBC Green Schools
- IGBC Green Factory Buildings
- IGBC Green Campus
- IGBC Green Villages
- IGBC Green Townships
- IGBC Green Cities
- IGBC Green SEZs
- IGBC Green Landscapes
- IGBC Green Mass Rapid Transit System^[6]

How are libraries becoming green?

Green design is an integrated process. None of the aspect of a building's architecture makes its green architecture. Without proper integration from the earliest moments of the planning phase, redundancies can occur, eliminating many of the potential benefits of sustainable design. Good sustainable design capitalizes on the synergistic relationships that occur between the various design elements. Buildings can be designed in such a

way in which, good design in one category helps another category to fulfil its goal. LEED and IGBC mainly focused on these elements into five categories:-

1. Site selection:

Choosing a good site for the library building is very important. Site has a large impact on how ecologically friendly the library will be. LEED provides guidelines for site selection. There are a number of questions to consider that will help guide the site selection process, including what kind of impact will construction have on the local environment, will there be erosion, what can be done with storm runoff, and is the site already green? Libraries should be located in a densely populated area, near a number of other service related buildings. People should be able to reach the building via public transportation and the parking lots should give priority, parking to those driving energy efficient automobiles, like bi-cycle, electric car, etc. The heat island effect can be reduced by shading hard surfaces, putting them underground, or by implementing a vegetative roof.

2. Water conservation:

Most of the Asian countries are water stressed and in countries like India, the water table has reduced drastically over the last decade. IGBC Green New Buildings rating system encourages use of water in a self-sustainable manner through reduce, recycle and reuse strategies. There are so many ways for libraries to conserve water. A number of them rely on proper site selection. If a site is selected properly, strategies can be used to capture rainwater runoff to be used in irrigation. Extra tank can be maintained for rainwater harvesting and it can use for toilets, bathrooms, irrigations, cleaning and for other things.

3. Energy conservation:

Use of Solar and Wind Power can be utilised inside the library and energy can be saved. The building sector is a large consumer of electrical energy. Through IGBC rating system, buildings can reduce energy consumption through energy efficient building envelope, lighting, air conditioning systems, etc., Energy efficiency is considered by many to be the most important category in becoming sustainable. In the LEED rating system it is the heaviest weighted of all the categories. On site renewable energy systems, includes solar, wind, and geothermal, provide an independent supply of energy.

4. Building materials:

Recycled waste products are to be used as materials for library buildings without causing too much damage to the natural environment. Recycled products can be unused papers, plastics, tyres of cars, broken furnitures etc. And these products can save many trees for not using wood. It also includes use of biodegradable materials, non-use of plastics and other such products.

5. Indoor air quality:

Building should be designed well for indoor air quality. Proper use of ventilation is to be made for air filtration. The lack of ventilation makes buildings expensive to cool and also traps harmful toxins that can do serious headache, fatigue, sinus congestion, nausea, skin irritation etc. Toxins come from a variety of sources. Materials that are used for making the library, including paints and carpeting; have volatile organic compounds (VOCs). They produce ground-level ozone after reacting with sunlight and nitrogen. The carbon dioxide that people breathe into the atmosphere is another toxic gas. To improve air quality, materials having low VOC content and CO₂ monitors, thermal comfort, Air Contaminant Concentrations, Combustion Products have to be installed which give a pleasing comfort to people who are spending maximum time inside the rooms. Therefore, green buildings need to be designed in a way in which the air gets recycled and does not stay stagnant. A green library is not just about taking care of the environment, it is about taking care of the health and well-being of those who work in it and patronize it.^[7]

Some Green Library Buildings in the World:-

- National Library, Singapore
- Public Library of Charlotte and Mecklenburg County
- Children's Museum of Pittsburgh
- University of California, Merced Kolligian Library
- Minneapolis Public Library
- Council Tree Library, Fort Collins, Co
- Candler Library, Emory University, Atlanta, GA
- Dexter Library, Ashland
- Eden Prairie Library, Eden Prairie.
- Harperwoods Public Library
- Kilton Public Library, West Lebanon
- Osining Public Library, New York

Some Green Library Buildings in India:-

- Anna-Centenary Library, Chennai
- Perma Karpo Library, Ladakh
- National Library of India, Kolkata
- Karnataka University Library
- NIT, Library Silchar Assam, India
- NIT Trichy – Library
- Delhi University Library
- Calcutta University Library
- Madras University Library
- Mumbai University Library

Future of Indian Green Buildings

LEED certifications are increasingly becoming commonplace in India. Our strategic partnership with The Energy and Resources Institute (TERI) is anchored around accelerating the development of green, high performing buildings across India and Southeast Asia. LEED and TERI's GRIHA (Green Rating for Integrated Habitat Assessment) rating system are proven market transformation tools that are essential for India's resource efficient future.

USGBC has also established a LEED hub in India to further accelerate the adoption of LEED in India. The LEED hub is a local technical, market, certification and customer support centres for LEED project teams. The LEED hub adds significant capacity in the market, encouraging even greater adoption of green standards across more populations in the region. Helping project teams successfully navigate the design, construction and operations of buildings to achieve the requirements of LEED certification the LEED Hub also delineates the local strategies for business development and brand advocacy. Over the years, the Indian Green Building Council (IGBC) has been instrumental in mobilising the green building movement in India and helping establish LEED as a key driver for market transformation. USGBC remains grateful to IGBC's early support of LEED India and its ongoing leadership in India. USGBC and IGBC continue their collaboration in advancing the uptake of green buildings in India. LEED India projects registered with IGBC till June 2014 would be certified by IGBC. LEED projects in India registered after June 2014 would be certified by the Green Building Certification Institute (GBCI). These efforts are in line with their goal to handle certification of LEED buildings across the globe, by one agency.

Conclusion:

India is a developing country and it should develop in all fields. Green Buildings has very important role in the environmental protection. Libraries and librarians are directly related to the society and their green buildings are giving them great opportunities to educate the citizen. The duty of a Librarian is not only to provide information to the users but they should play a role of leader to construct modern Green Buildings to save our natural environment. For the next generation, library professionals should move beyond environmental sustainability exemplified by various practices of "Greening Libraries" and focus on proactive steps to guarantee future sustainable development of libraries.

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