CONVERSION FROM MODERN LIBRARIES INTO GREEN LIBRARIES TO ACHIEVE SUSTAINABILITY*

BY

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Abstract:
At present the term "Sustainable Development" is becoming more popular. As we all very well know that the word 'GREEN' has become very popular word in all fields. India is also not far behind in Green environment movement. Some of the Indian Libraries very recently started to have provisions for natural lights, energy saving bulbs in the places within library premises, provisions of natural air, awareness on cleanliness, hygienic and clean toilets and provisions of garbage bins at different places. Green buildings produce less gas emission and electricity consumption is less than the conventional buildings.

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Introduction:

At present the term "Sustainable Development" is becoming more popular. Sustainability has to be achieved in greater depths including the academic setups. Libraries which provide the collection of every type of reading materials shall be highly transformed Green so that they can be sustainable and harmless to the environment. As we all very well know that the word 'GREEN' has become very popular word in all fields. The word is very much related over Global Warming and its Harmful effects so we require everything to be GREEN to save the Mother Earth. Libraries are also keeping pace with this most popular word and gradually the concept of "Green Library" is attracting attention of Library Administrators Worldwide and the initiative to develop Green Libraries are on rise.

The term Green Library or Sustainable Library is gaining much popularity among the Library Professionals. The concept purely means to Greening Libraries and reducing the eco-D*egradation. Green Libraries are not very far behind in today's Green Environment Movement. The concept of Green Libraries taken birth in 1990s and in 2003 it started its great momentum.

History of Green Library in India:

As we all know that the whole universe is facing severe problems related to Environmental Degradation and Environmental Pollution and every country is trying to put their efforts in overcoming this environmental threat. In this Scenario, some emphasis is given on burning issues like Health & Hygiene and Environmental Awareness. Indian Libraries are also managing to keep little pace with this burning issues and the initiative of overcoming this frightening situations. Some of the Indian Libraries very recently started to have provisions for natural lights, energy saving bulbs in the places within library premises, provisions of natural air, awareness on cleanliness, hygienic and clean toilets, and provisions of garbage bins at different places. TERI has played an important role in forwarding the Green Library Movement in India. This organization has rated first about the Green Building in India in the year 2001. For the development of a unique tool for rating the Green Buildings, TERI initiated first in India. They named it GRIHA. In the year 1985 a non-profit organization COSTFORD (Centre of Science and Technology for Rural Development) in Kerala is established which focuses on development of housing and made significant gains in providing unique philosophy and technology to take major responsibility in improving Green Library Movement in India.

Cecil H. Green Library
Type : Academic Library
Established: 1919
Architect: Arthur Brown Jr.
Location: Stanford University, Stanford, California

Definitions of Green Library:

Green designs are a recent trend, explaining about the library of twenty first century. Green Library Movement which is a whole of Librarians, Libraries, Colleges and University Campuses is planning to Greening Libraries and reducing environmental hazards. Green Library Movement is promoted by constructing green library buildings, by greening existing library facilities, by rendering green library services, and by promoting environmentally supportive and sustainable practices within the library. Some definitions of green library are as follows:

- According to Oxford English Dictionary (2008) the term "Green" is defined as "pertaining to, or supporting environmentalism." The term "sustainable" relates to forms of "human economic activity and culture that do not lead to environmental degradation, especially avoiding the long-term depletion of natural resources"
- According to Online Dictionary of Library and Information Science "Green/Sustainable Libraries as a library 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 like water, energy, paper, and responsible waste disposal recycling, etc"

Steps towards making a Good Green Library:

Following steps are involved in building a good green library:

***Site selection**: India has geographically varied conditions from vast deserts to high hill tops, planes and very vast coastal areas so one norm cannot fit throughout the country. Besides population, reach ability location, parking and local conditions like storms, erosion, moisture and dust, etc. are also to be considered before finalizing site. A proper site selection is very necessary for a green library in comparison to other buildings.

*** Water Conservations**: Use of roof water harvesting, green toilets, water recycling, etc. can save lot of water for proper landscaping and greenery in and outside the library building.

*** Energy Conservation**: Energy Conservation:- It is most important aspect in green revolution. Use of wind and sun can manage temperature and light in place of electricity. It saves lot of natural resources like coal and emission of harmful gases like Co2 which will be helpful in reducing global warming. It is economic to the institution in electricity bills.

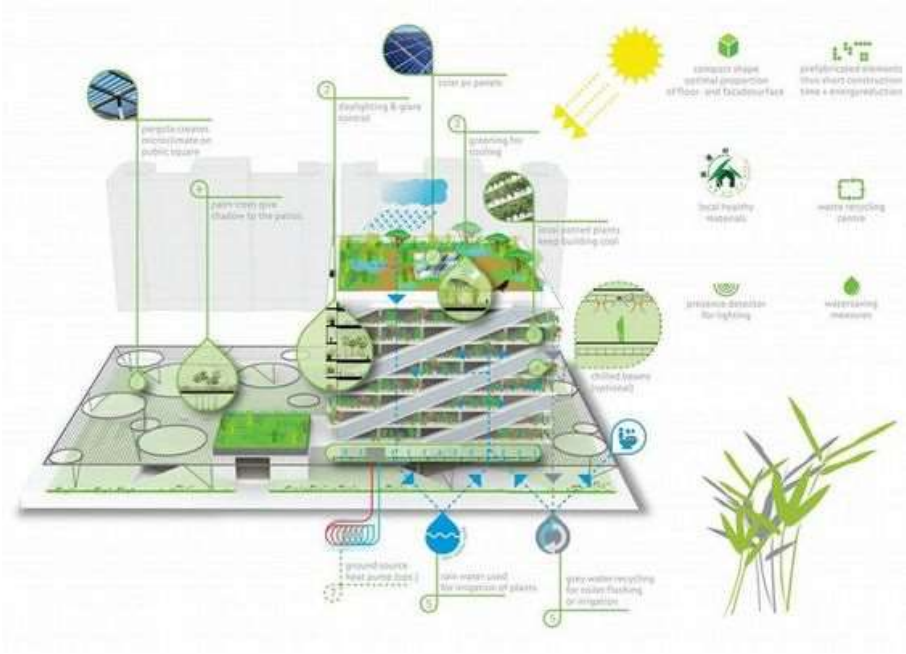
*** Building Material**: Use or recycle of waste products will reduce damage to natural environment. Less use of wood will save many trees. Use of locally available material will save transport cost and fuel. It also includes use of biodegradable materials, non use of plastics and other such products. Many modern building technologies have emerged which are more eco friendly and should be used in new library buildings.

*** Indoor Air Quality**: Lack of ventilation at public places can cause many harmful effects such as bacterial infections, etc. The air should be recycled and should not be stagnant. Least use of air conditioners will reduce emission of harmful gases responsible for holes in ozone layer and intern global warming.

Elements of Green Library Designs:

Libraries considering green design will often look at the Leadership in Energy and Environmental Design (LEED) rating system. Brown has identified following green design elements which can be incorporated into libraries:

- Community collaboration.
- Green materials
- Green roof
- Raised floor system
- Energy efficiency
- Natural ventilation
- Green power and renewable energy
- Indoor environmental quality



Kaohsiung-Public-Library/ GREEN BUILDING DESIGN

Standards for building a green library:

There are various standards for building the Green Infrastructure. Some of the famous standards for building green infrastructure are as follows:

- Chicago Illinois Standards
- Brown Green Standard
- IGBC Indian Green Building Council Standard
- Green Rating for Integrated Habitat Assessment (GRIHA)
- LEED (Leadership in Energy and Environmental Design)
- BREEAM

Reasons to Build Green Libraries:

There are several reasons why libraries would want to build green or incorporate green features into their buildings.

- The cost of constructing green buildings has become affordable. It is now possible for libraries to build green buildings on conventional budgets.
- Most readily available energy resources are finite resources.
- It is important that we reduce the carbon footprint of our buildings.

Benefits of Green Libraries:

Green buildings produce less gas emission and electricity consumption is less than the conventional buildings. A Library with green roofs is covered with the vegetation so it will absorb rainwater and will also provide insulation which will result in less heat. Green roofs add to the aesthetic appeal of the building which makes it attractive and beautiful. Installation of motion sensors in break and meeting rooms to automatically turn off lights when the rooms are unoccupied reduces energy consumption. The Design of the Library space as per green Library standards will reduce energy consumption.

Green Library Challenges:

India is also not far behind in Green environment movement. For building the green library environment Librarians and the Library professionals are facing lots of challenges overall.

- Books need special care from extreme temperature, moisture, sunlight, paper bugs, sunlight, fungus and rodents and finally with some dishonest readers too.
- Complications related to weight of books and stacks and movement of the readers on the floor make it more complicated.
- Extension for future growth in relation to books and readers and technology complicates building structure and design.

Suggestions for making Green Libraries:

Following suggestions are made for green Libraries in India:-

- Library buildings should be properly planned using Green Building Standards;
- Old Library building should be reconstruct as for as possible on the times of Green Libraries standards;
- Library building should have a good land scape;
- Use of solar energy should be promoted at roof tops;
- Roof water harvesting and roof top gardens, etc. should be encouraged;
- Proper reader spaces should be made available with the use of natural resources;
- Libraries should take initiatives to publicize green library impacts to its readers;
- Librarians should be part of planning of buildings for institutions;
- Librarians should be aware of new in green library initiatives and.

- UGC should take steps to improve library buildings in academic institutions and convert them green libraries by providing grants.

Green Library: International Initiative:
Green libraries are quite popular all over the world and librarians are transforming their library buildings into green library buildings. There are some of the green library initiatives working in the world. This list is not exhaustive but exemplary.

Thomas Golisano Library at Roberts Wesleyan College (2007): This is the first academic library building to achieve a LEED Silver certification and uses various methods to make it 40 percent more energy efficient than the New York State Energy Code recommendations. Library shelves limit daylight from side windows, so the design compensated by using a large atrium to provide natural daylight to both levels of the building. Use of white paint and solar shades reflect the direct rays of the sun and bounce light to specific areas. The internal lights respond to outside conditions.

Beitou's green library (2006): East Asia's most eco-friendly building. The library's large windows help cut electricity use in two ways. An abundance of natural light means less interior lighting is needed. Also, the windows are often opened wide for ventilation, thus reducing the need for fans and air-conditioning. One part of the roof is covered by photovoltaic cells that convert sunlight into electricity. The library conserves water by capturing rainfall. The sloping roof gathers rainwater, which is then stored and used to flush the library's toilets.

Brighton's Jubilee Library UK (2005): winner of multiple building awards including a BREEAM excellent Rating. Solar and wind energy are used to heat and cool the building naturally, except during extremes of temperature. Air is taken in from outside, circulates through the building through spaces in the walls and under the heat-absorbing floor, and is pushed out through roof vents. Rainwater is harvested from the roof, collected in tank and used in the toilets. Internal lighting automatically adjusts to the conditions. The library emits half as much carbon dioxide as buildings of comparable size.

Amsterdam Public Library (2007): It is the most sustainable building in Amsterdam based on BREEAM method. The library building uses a ground source heat system together with highly efficient boilers. It also makes use of free cooling from the cold air outside whenever possible. The building is equipped with abundant solar panels, it has double glazing, and sustainable materials have been used.

Fayetteville Public Library, Minneapolis (2004): It has earned many certificates. It has green roofing and reduced air temperature by 20 degree celsius, saving Rs. 2,40,000/- per annum energy cost. Roof water is harvested for landscaping and irrigation further reducing energy cost by 75%. Natural lights have been used for public areas. Trees were re harvested.

National Library, Singapore (2005): It is known as greenest building on the planet. It uses light shelves allowing light to filter into the library. Sensors dim or brighten the lights for maximum comforts.

Green Library: Indian Initiatives:

India has been ranked third (899 projects) on the list of top 10 countries in Leadership in Energy and Environmental Design outside America, according to the latest US Green Building Council report 2018. China followed by Canada occupies the top two ranks in the ranking of the top 10 countries for Leadership in Energy and Environmental Design (LEED) outside the US. There are numbers of Green library has situated at different part of the country. There are some green libraries are given below:

Anna Centenary Library (2010) is an established state library of the Government of Tamil Nadu. It is located at Kotturpuram, Chennai. In the building is designed in such a way that the reading area receives good daylight. The western end is flanked by the service areas to prevent solar radiation. The seven-storey atrium allows in abundant natural light. The library building received the LEED NC Gold rating from IGBC becoming the first library building in Asia to reach this. This project has achieved 43 LEED points, highest amongst any government buildings in Tamil Nadu thus far.

Karnataka University Library: launched a project on Green Library. The concept is to provide a congenial natural environment for the study. This system is a blend of tradition and modern system with all amenities. No books shelves, chairs or tables but benches are installed under the trees so that students can sit and read the books taken from the university library. Keeping this in vogue the Green Library has been established in the centre of the campus and providing all facilities to students for study. The facilities include sitting, supply of drinking water, WiFi connectivity and other facilities etc.

Perma Karpo Library(2010):designed by Arup for a small village in Ladahk (in the Indian Himalayas), is the perfect example of how good design, science and local knowledge have worked together to create a building that is as sustainable as it is beautiful. Amongst the technologies and design solutions used on site: ventilated Trombe Walls, wool insulation, a mud roof, timber paneling and even solar panels on the roof. The materials are locally sourced, and the experience and design solutions are worked out with the people on site to ensure that the knowledge remains in place.

Delhi University Library: The great height, vast open areas, thick walls, windows all through the eastern wall are some green gestures that are in built in this heritage structure as well as nurtured even today by the present library leadership.

The Role of Green Librarian:

- Librarian should always make efforts to promote green library movements by using different online tools like social media.

- The Librarian constantly willing to work under the Eco-library system and identify those people who are willing to work in this environment.
- He can promote green library tools, techniques to encourage others.
- A Librarian can encourage other librarians towards green library by discussion, seminar, and conferences.
- The green librarian's role is most dynamic he is also called as eco librarian because he has to handle the budgets to support the organizations.
- Use wooden furniture and material because these are bio degradable materials.
- Paper Insulation is also an ultimate trick to make environment friendly building. It is made from newspaper and cardboard which are recyclable. Also it protects wall from fire and insects.
- Library can use wool brick instead of burnt brick. Solar tiles or panel can be used for roof.
- More and more use of bamboo by replacing steel and rooftop planting can be a good idea.

Conclusion:

Green buildings are not only saving money in terms of energy but also in terms of health, productivity and morale of employees. Library is considered as a growing organism. A green library design is less expensive because of reduced upfront costs energy and water conservation and increased efficiency. Green library initiative is a new concept in India and is in infant stage. We request the system as a whole to be more conscious about library buildings to support Green Library initiatives but with caution and proper care because excess greening and moistures can damage books. Now a day software are available which can estimate library's energy performance and provide strategies for energy savings and cost of building. Solar 5-5 is one such program which builds 3D model of the library and calculates all that. All of us need for a change in mind set to improve health of heart of an institution – 'The Library'. India has taken initiative in green movement in the world to save the earth. Let us hope a green future in the world in India.

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