

# GREENING THE LIBRARY FOR SUSTAINABLE DEVELOPMENT

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**Abstract:** Around the world the idea and behavior of creating green libraries is approaching a tipping point and transforming into a library movement by building green library buildings, by greening existing library facilities, providing green library services, and embracing environmentally supportive and sustainable practices within the library. The two most important things for making healthy and prosperous sustainable libraries are economy and ecology. The main objectives of this paper are to analyze the importance of green libraries; to identify the standards for green libraries in India; to identify the major green library initiatives at the international and national level; to explain various techniques and methods for greening the library; and to make suggestions for building green libraries for sustainable development. The paper concludes that librarians have to be keen on updating themselves on sustainability trends in the field of librarianship and should provide awareness and create the space in the libraries to exemplify the Green practices

**Keywords:** *Green Library; Sustainable library; Indian Green Building Council (IGBC); Leadership in Energy and Environmental Design (LEED-India)*

## **1. Introduction:**

The Green Library Movement emerged in the early 1990s and gained popularity in the library profession around 2003. This innovation is happening by building green library buildings, by greening existing library facilities, providing green library services, and embracing environmentally supportive and sustainable practices within the library. The two most important things for making healthy and prosperous sustainable libraries are economy and ecology. That is, the libraries can manage the use of resources and save money and time and they can keep the relationship between living things and their environment and can make eco-friendly environment.

It is worth noting that library building has one of the highest green to non-green ratios. Over the past several years, libraries have become one of the most common categories of new construction to embrace sustainable design. Green library management emphasizes a new mindset of taking responsibility for the stability of nature, health of library users and staff and catering for the needs and interest of future generations of users. Libraries as non-commercial

and service oriented public buildings are particularly suited to give examples to illustrate the idea of sustainability, to distribute and to disseminate this idea to the people.

## **2. Objectives:**

- ❖ To analyze the importance of green libraries.
- ❖ To identify the standards for green libraries in India.
- ❖ To identify the major green library initiatives at the international and national level.
- ❖ To explain various techniques and methods for greening the library.
- ❖ To make suggestions for building green libraries for sustainable development.

## **3. Review of related literature:**

The amount of information available on green libraries and green library practices is limited but continues to grow. The earliest articles on green libraries appeared in the 1990s. February 1991 issue of The Wilson Library Bulletin had a special section on “Libraries and the Environment.”

In an article on “The Green Librarian”, James and Suzanne LeRue (1991)[1] explained in detail how to be environmentally supportive at home and in the library. A paper, “The New Green Standard”, Bill Brown.(2003)[2] discussed the emerging trend of green libraries and proclaimed that libraries were on the cutting edge of green design. The article “Public Input Yields Greener Library Design” by Louise Levy Schaper (2003)[3] described how the Fayetteville Public Library’s Blair Library was the first building in Arkansas to be a registered LEED building.. The article “Keeping Track of Green Libraries” by Jennifer Pinkowski (2007)[4] reviewed the Green Libraries website (greenlibraries.org), which is building a directory of green libraries. Jane C. Neale (2008)[5] in a paper “Go Green”, described how libraries can be more eco-friendly.. Dorthy Waterfill Trotte (2008) [6] in a paper entitled “Going for Green”, discussed three environmentally friendly libraries and offered tips on how librarians could make their libraries greener.

A study of “Green” libraries by Loder (2010) [7] revealed that not only has energy conservation become important but that spaces designed for users rather than books have become paramount. Users want and need a greater variety of spaces, which purpose-built rooms are better at meeting. Sahavirta (2012) [8] in an article revealed that commitment to green values may increase environmental sustainability and help libraries to take a new and visible role in changing society. In a paper Divya and Vijayakumar (2013) [9] rightly pointed out that this is the right time for librarians to support green library movement. Aulisio (2013) [10] in a paper argued that a green library is more than what the architecture entails by using example initiatives and providing recommendations for green library operations.

## **4. Designing Green Library Building:**

Green perspective and approach to library buildings and services considers all aspects of the library ecosystem-the building, the services, the finishes, the systems that support the physical building and operations as well as the supplies and services offered or used by the

library. The Oxford English Dictionary defines the term “green” as “pertaining to, or supporting environmentalism” [11]. Indian Green Building Council (IGBC) defines “A green building is one which uses less water, optimizes energy efficiency, conserves natural resources, generates less waste and provides healthier spaces for occupants, as compared to a conventional building.” [12].

## **5. Standards for Green Libraries:**

### **5.1 Indian Green building Council (IGBC):**

Create the possibility for Green Library Building construction which otherwise would have been a utopian fantasy. Indian Green Buildings Council (IGBC) established in the year 2001 to promote and rate Green buildings in India. There are about 2190 registered buildings, 398 rated buildings and also 1082 IGBC aggregated professionals.

### **5.2 Leadership in Energy and Environmental Design (LEED-India):**

Leadership in Energy and Environmental Design (LEED- India) green building rating system is a nationally and internationally accepted benchmark for the design, construction and operation of high performance green buildings. There are four certification levels (Certified, Silver, Gold, Platinum) awarded according to achievement as evaluated by points using the LEED scorecard.

LEED rate on 100 points and certify the buildings on the following criteria:

25-40 points as Certified.

41-50 points as Silver.

51-60 points as Gold.

61-80 points as Platinum.

LEED-India promotes a whole building approach to sustainability by recognizing performance in the following five key areas namely 1) site location, 2) water conservation, 3) energy efficiency, 4) materials, 5) indoor air quality, and a bonus category for innovation and design. LEED also uses various categories to judge the buildings sustainability through Design Elements



- 5.2.1 **Site selection:** Before building a library, a site must be chosen. The selection of the site has a large impact on how ecologically friendly the library will be. What kinds 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? Also, the library 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. The heat island effect can be reduced by shading hard surfaces, putting them underground, or by implementing a vegetative roof.
- 5.2.2 **Water conservation:** Reduce potable water use by considering alternative on-site water sources (eg. Rainwater, storm water and air conditioner condensate) for custodial uses and toilet flushing, planting native and adaptable vegetation reduces the need for irrigation.
- 5.2.3 **Energy conservation:** 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, including solar, wind, and geothermal, provide an independent supply of energy.
- 5.2.4 **Building materials:** The primary responsibility in selecting materials for the library is to contribute as little waste as possible. Another responsibility is to choose materials that can be produced without causing too much damage to the natural environment. Reusing and recycling are going to become increasingly necessary in the future. Another material option is using quickly renewable materials such as bamboo in place of wood whenever possible. The widening availability of green building materials, along with the development of non-profit watchdog groups are two important factors in the greening of 21st-century library buildings.
- 5.2.5 **Indoor air quality:** Along with energy inefficiency, poor air quality has been another side-effect of the post air conditioning building design. Because most modern buildings are temperature controlled, they are designed to be airtight. The lack of ventilation can not only make buildings expensive to cool, it also traps

harmful toxins that can do serious damage to people's respiratory systems. To improve air quality, materials can be bought that have a low VOC content, and CO<sub>2</sub> monitors can be installed to ensure that CO<sub>2</sub> levels remain at a safe level. On average, people spend about 90% of their time indoors. Therefore, green buildings need to be designed in a way in which the air gets recycled, and does not stay stagnant. Indoor plants significantly improve a whole range of aspects of our indoor environment. The benefits cover a spectrum from physically cleaner air to direct beneficial effects on psychological health, task performance, illness reduction, productivity, lower stress and negative feelings, reduce noise and contribute to fulfilling at least 75% of Indoor Environmental Quality (IEQ) Criteria.

## 6. Major Green Library Initiatives:

Name and Place of the Library	Country	Features
Anythink Brighton, Brighton	USA	First carbon-positive library in USA
Ballard Branch Seattle Public Library, Seattle	USA	Green roof, conserve rain water, adds solar panels, skylights to use daylight and recycled carpet
Blair Library, Fayetteville Public Library	USA	First building in the state of Arkansas to register for LEED certification and features rainwater catch for irrigation, white membrane roof, cork flooring, recycled content furnishings, low VOC finishers and fabrics).
Bozeman Public Library, Bozeman	USA	Utilizes daylight, green materials that have been recycled, Photovoltaic system, received LEED silver certification.
Eden Prairie Library, Eden Prairie	USA	First in US to create natural gas fuel cell to create power and heat on-site. Efficient landscaping, recycled materials, low VOC materials and efficient lighting arrangements.
Crowfoot branch, Calgary Public Library, Calgary	Canada	Incorporates energy and daylight harvesting, reduce the use of water and use recycled materials.
Spanish Peaks Library, Walsenburg	UK	Geothermal system for heating and cooling. Flooring made of recycled rubber and recipient of Stephen H Richard award in 2010.
Helsinki	Germany	A green roofed and solar powered library
Kanazawa	Japan	A spacious and natural light filled environment supported by 6,000 small circular windows
Anna-Centenary	India	Solar control thermal insulation glass, green roof,

Library, Chennai		Library block at an angle that allows maximum daylight and eco-friendly
Karnataka University Library , Dharward	India	No books, book 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 .
The National Library, Singapore	Singapore	First green library for kids

### **7. Situation in India:**

TERI has been in the forefront of the green building movement in India. The organization has assisted the first USGBC rated green building in India, namely the CII - Godrej Green Business Centre way back in 2001, to get the coveted platinum rating. Having worked on several green building projects in the country, TERI envisioned the need for development of an indigenous tool for rating of green buildings in India. This rating system - GRIHA - has been adapted by the government of India as the National rating system. Globally, green building rating systems have been instrumental in raising awareness and popularizing green building designs. Keeping in view of the Indian agro-climatic conditions and in particular the preponderance of non-AC buildings, GRIHA has been developed as a rating system which is suitable for all kinds of buildings in different climatic zones of the country. TERI was formally established in 1974 with the purpose of tackling and dealing with the immense and acute problems that mankind is likely to face within in the years ahead on account of the gradual depletion of the earth's finite energy resources which are largely non-renewable and on account of the existing methods of their use which are polluting. TERI fulfills its mandate of sustainable development by advocating the concept of green buildings, which register minimal impact on the environment. TERI has constructed its buildings, in Gurgaon, Bangalore and Mukteshwar which includes resource- and energy-efficient, demonstrating the sustainable implementation of green practices.

In Kerala COSTFORD (Centre of Science and Technology for Rural Development) a non-profit organization established in 1985 focus on improvement of housing and made significant gains in providing alternative philosophy and technologies for providing cost- effective , energy efficient and more appropriate housing for all groups. Similarly, Habitat Technology Group established in 1987 is a non-governmental organization is totally committed to the concept of green and human architecture. It has been accepted as a nodal agency to carry out green buildings in Kerala.

### **8. Techniques and Methods for Greening the library:**

Some of the techniques on materials, energy and waste management that can be adopted for greening the library building is given in fig. 2.



Fig. 2

In order to make the libraries green we have to adopt following techniques:

### Materials & Equipments

- Take advantage of windows: Strategically placed windows will provide natural light and may help with heating or cooling costs.
- Use eco-friendly light bulbs which will save money and electricity.
- Use of geothermal heater and solar tubes that capture daylight and deliver it inside to illuminate interior space saves money and energy
- Put soft pads on the feet of chairs to protect the floor and reduce noise.
- Purchase eco-friendly computers: When you need new computers, search for eco-friendly versions.
- Use laptops which use less electricity than desktop versions.
- Eco-friendly, safe computer cleaning materials can be used for cleaning the computers such as biodegradable dust cloths and old t-shirts.
- Improve areas with insufficient lighting; reposition light fixtures to improve lighting.
- Replacement of outdated appliances.
- Cut down on paper by moving card catalog onto computerized catalogue, instead of paper newsletters use e- versions, provide online services by making use of web-2.0 technologies, use e-receipts instead of paper receipts.
- Promote roof vegetation and start an organic garden: Grow a garden to spread awareness on sustainability and provide a healthy eating option for participating library patrons and workers.
- Use natural pesticides for preservation of books and keep the plants and flowers healthy without damaging the health or the environment.

## **Energy:**

- Use Energy Star products for saving energy.
- Use fans: If you can, install ceiling fans to cool down the library without overusing the A/C.
- Use of alternative energy sources such solar energy will save money.
- Automate power down. When procuring new PCs, buy those with intelVPro. They'll let you remotely set power cycles for all your PCs.
- Find efficient CPUs. Computer companies are producing far more energy efficient CPUs.
- Have a server strategy that guarantees power reduction. If you can't implement it all at once, do it piecemeal. Servers not only use a lot of energy they put out a lot of heat, which increases cooling costs.
- Reduce heat islands by eliminating or shading blacktop paving and dark roof surfaces.
- Encourage employees to car pool: Help your employees set up a car pool or van pool so that they can cut down on pollutants.
- Motion and light sensors, timers and energy saving dimmers can be easily and inexpensively retrofit to existing buildings

## **Waste Management:**

- Recycle computers: Safely recycle computers instead of harming the environment when you throw them away. Buy recycled ink cartridges and other supplies.
- Discard weeded books by selling it to used book dealers, exchange library materials with other participating libraries or donate to other libraries.
- Get rid of waste by composting and stop using plastic bags.
- Start a paper drive: Ask the members of the library to bring in old newspapers and other papers to recycle: they may even be turned into books one day.
- Books from the shelves and the books deliberately hidden by library users were recovered from the top of shelves were dusted carefully. Shelves and floor were washed and mopped. This result in clean, bright, refreshed collection with no dirt.

## **9. Suggestions:**

- Spread awareness about the library's green activities through social media or other methods regularly.
- Evaluate the library's cleaning and maintenance routine to identify and reduce the use of hazardous chemicals.
- Libraries can use a variety of tools to popularize the 'green concept' and educate their patrons about the features of their green buildings. These include in-library displays, publications, and library programs relevant on 'going green'.
- Libraries can arrange strategic thinking and planning sessions to ensure sustainability.
- Identify the librarians who are willing to promote green library techniques and encourage them.

- Librarians should focus on the chance to transform an adaptable building to a high level ecological-friendly library.
- Sustainability in library buildings should be taught to LIS students so that new generation librarians will adapt these ideas.
- Make better use of cloud computing services in order to avoid print materials.
- Government should take steps to promote green libraries through award and financial aid to maintain such libraries.
- Librarians have to be keen on updating themselves on sustainability trends in the field of librarianship.
- UGC should make it mandate for all colleges to get the approval to go for Green Libraries and also green buildings.
- Government/Universities should make all the efforts to transform Libraries into Green buildings/Libraries, wherever it is possible .
- Librarians should provide awareness and create the space in the libraries to exemplify the Green practices.
- All Librarians should suggest and help in creating landscape around the building.
- Library building architecture should be planned well with such environmental friendly material & build at low cost with recycled materials.
- Some sign boards should be reflected to make awareness on green buildings and Libraries maintenance.
- Locally available environmentally friendly material should be promoted for constructing Library buildings.
- Recycling concepts should be promoted and practiced & encouraged to implement the same practices by the unemployed youth.
- Green concepts should promoted, become examples in Libraries attached to Organizations, Universities and Industries
- In India The green concepts were implemented in Parnashala , where in the leaves, thamrapathras were used instead of paper.
- Cross Ventilation concept, direction of building doors, windows to reduce heat, increase ventilation aeration (Vastusastra ) was much popular in Indian context.
- It is very necessary to plan Green Libraries, which was popular concept in India. That treasure need to be explored and reintroduced in India.

## **10. Conclusion:**

Green image is a good image for the libraries and should use their way of going green to promote a powerful green image towards their stake holders and users. Librarians should act as role models for sustainability by providing suitable and relevant information related to green issues and concerns. 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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