

# Environmental Friendly and Energy Conserving Green Libraries: Few Glimpses of Anna Centenary Library, Chennai

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**Abstract:** *Libraries are the buildings which stores human knowledge and intellectual assets. Even when digital storage of information revolution started in 1980s, traditional libraries took a new dimension in combating challenges and serving as multi-modal access to information. Architecture combined with technology has created innovative library buildings which can maximize the efficiency with minimum space and costs. Libraries and knowledge centres are ever growing organism and library buildings should also cope up with the expanding future needs. Ecological green libraries are the need today to save energy and power. This paper tries to highlight the features of one such green library of India, “Anna Centenary Library” at Chennai and also the concepts of going green.*

**Keywords:** Green Libraries, Anna Centenary Library, Environment friendly libraries, LEED, Chennai’s green library, library architecture.

## 1. Introduction

There is a wide spread of awareness among the people to protect the Mother Nature and to be conscious about the environment. Public libraries which impart knowledge to the society also have the responsibility to follow what they preach to its users. They can also serve as example to the concept of green life style. Recent innovation in the field of building technology helps to achieve the mission of sustainable green libraries and reduce the global warming to save our planet Earth. Anna Centenary Library at Chennai is one such green library in Asia and standing symbol of green architecture. This paper attempts to highlight its unique features and discuss the techniques followed in the library.

## 2. Library Building Standards

Libraries are the buildings which stores knowledge. When fire destroyed the library at Alexandria in 4000BC, over half of all mankind’s recorded knowledge was lost, or as Ted Hughes put it in his poem, Hear it again, the burning of the library ‘brain-damaged the human race’ (Oxford Dictionary of Quotations, 1999).

Keyes Metcalf, the doyen of library consultants, wrote his important book, “Planning Academic and Research library buildings”, in 1965, the great guide on this particular subject. The revised edition (1986) contains the following statements of purposes:

- ❖ protection of books and collections of other records from the elements, poor environment and mishandling;

- ❖ housing of books and collections in a variety of accommodations for ease of access;
- ❖ housing of the various catalogues and related bibliographic tools which enables the reader to find relevant materials in the local collections and supplementary holdings in other institutions;
- ❖ accommodation of readers and other clientele who need immediate or frequent access to collections and services;
- ❖ provision for staff who select, acquire, organize, care for and service the collections, and who aid readers in their informational needs;
- ❖ quarters for ancillary functions such as photocopy services, bibliographic instruction, audio-visual materials preparation, computer support facilities, etc.,
- ❖ quarters for library administration and business offers such functions as personnel, finance, fund-raising, publications, graphics or signage, building operations, security, supplies, mail and delivery service etc.,
- ❖ study, research and writing quarters for students, faculty and visiting scholars
- ❖ space to publicize resources or services through exhibits, lectures, publications, etc.,
- ❖ structure to serve as a memorial to an individual and symbolism of institution's academic life in pursuit of scholarly achievement.

The architecture of the libraries should be designed in such a way that they can satisfy the above basic physical provisions irrespective of public/special/academic libraries. The policies and decisions of the government or institutions should accommodate in concern of the interests of the reader community.

### **3. Going Green Matters**

The concept of “going green” emerged from an international agreement known as “The Kyoto Protocol” (1997) linked to the United Nations Framework Convention on Climate Change, which commits all the countries of the world by setting internationally binding emission reduction targets. “Going Green” means to pursue knowledge and practices that can lead to more environmentally friendly and ecologically responsible decisions and lifestyles, which can help protect the environment and sustain its natural resources for current and future generations. According to Oxford English Dictionary, a term “Green” or “Sustainable” are defined as “Conserving an ecological balance by avoiding depletion of natural resources” (Online Oxford English Dictionary, 2013). Environmental Protection Agency (EPA) defines Green buildings as “Green or sustainable building is the practice of creating healthier and more resource efficient models of construction, renovation, operation, maintenance, and demolition.” Indian Green Building Council (IGBC) defines “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.”

#### 4. Review of Literature for Green Libraries

Literature on ‘green libraries’ took root in the early 1990s in publications such as *The Green Library Journal* and from the work of authors like C. Atton (Anotnelli ). After this initial rush, the subject’s popularity cooled until 2003, when “going green” was again recognized as an important topic. Publications such as the Oregon Library Association Quarterly (OLA Quarterly Winter 2007) have devoted entire issues to the subject, while trade journals, blogs, and other grassroots publications have increasingly encouraged libraries to practice green librarianship (Anotnelli). Initiatives were developed promoting increased environmental awareness and ecological sustainable design as well as services in libraries and were published in journals, books and more and more online on “green” webpages (Coyle 2008).

Wanda Urbanska notes: "Building a green library may represent the largest public statement any community can make to show its support for sustainability". An ecological intelligently designed facility “can be part of a library’s marketing strategy to demonstrate to its community that it cares how the funds allocated to it are spent with an eye towards reducing future costs.” (Aldrich 2013, 16)

Bill Brown writes: Well-designed green buildings cost less to operate and maintain than conventionally constructed buildings. They use less energy and natural resources. They are better integrated into their sites and communities. They are more comfortable, enjoy more daylight, and are more attractive to customers and employees. The United States of America stands as the pioneer in the movement of Green Libraries and associations like ALA, IFLA also contributed its efforts in accelerating libraries to turn green.

#### List of Green Libraries across the Globe

- 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

## 5. Social Role of Public Libraries

Public libraries referred as “Cradle of Democracy”, “People’s University” are the life-long learning centres of any nation. Keith Richard Quotes, “When you are growing up there are two institutional places that affect you most powerfully; the church, which belongs to God, and the public library, which belongs to you”. India and especially Chennai has the rich history of public libraries and also library building. Connemara public library, Thanjavur Saraswati Mahal Library are the remarkable library buildings still shining as symbol of excellence.

According to CABE (the UK’s Commission on Architecture and the Built Environment):

- ❖ Well-designed public libraries help revitalize neighbourhoods and cities, both physically and socially
- ❖ Libraries increasingly provide support for public services in areas like welfare and life-long learning.
- ❖ Good library design increases the level of usage and attracts new users
- ❖ Good design helps to retain staff and helps with recruitment
- ❖ Well-designed libraries reduce crime and vandalism.

Hence, public libraries have an important role to play in supporting the knowledge and access to information necessary to raise awareness. According to the CABE report *Better Public Libraries*, published in 2003 (CABE, 2003), outmoded design and poor location were responsible for the decline of 17% in the use of public libraries in the UK over the previous decade. CABE recommended that libraries should be communication centres catering not just for residents but for the needs of businesses and tourists. There should be cafes and lounge areas to make long-stay visits to libraries more comfortable. The report also called for buildings that engendered a sense of fun in the discovery of new knowledge and the use of new technologies. Attracting more young people to libraries is important for the future of the building type and in achieving the wider social goals. In being attractive to consumers, the architectural design of libraries should aspire to engage in the values of the communities where they are located rather than appeal to readers of architectural magazines.

Sandra Vandermark in her book “Using Teen Patrons :As a Resource in Planning Young Adult Library Space in Public Libraries” says that, Public libraries can be important in helping a young adult make the transition from childhood to adulthood through an effectively designed young adult library space. Such a space has the potential to provide the resources and environment that promote intellectual, emotional, and social development. An effectively designed young adult space is an environment for the following:

- Encouraging teens to develop the habit of lifelong learning through the library.
- Motivating lifelong reading for information and pleasure.
- Providing skills for information literacy

- Providing library collections and services for all young adults in the community to meet the following needs: educational, information technology, cultural, leisure/recreational

Public libraries should focus in its building design that can attract its users especially budding readers. Learning and discovery is an exciting experience and public libraries should convey the sense of joy and excitement to its readers. Public Libraries with creative and stimulating environment with natural lighting, perfect ambience will increase the count of users and makes reading a joyful event.

## **6. Anna Centenary Library – The Pride of Chennai**

Anna Centenary Library shortly ACL was started in the name of great Leader and visionary Mr. Annadurai in memory of his centenary birth year to enlighten the masses of Chennai on 15<sup>th</sup> September 2010. Neil Postman quotes about libraries as the place where “Turning raw knowledge into improved knowledge” occurs. More than thousand visitors per day and three thousand visitors at weekends shows that Chennai is gaining intellectual status. Hand carved bronze statue of Anna reading a book at the entrance of the library cordially welcomes the reader community. Anna, the book lover’s quote, “The Library shall find a place next to basic necessities of life” is engraved below his statue.

The reception greets the users with paintings portraying Darwin’s theory of evolution, arts, culture and sports and attractive mega bronze vilakku. ACL is spaciouly built on 8 acres totaling a combined built up area of 3.75 lakh sq.ft has totally ground + eight floors and the storage capacity of 12 lakh books. The noteworthy sections are unique Braille section and kids special first floor spread over 15,000 sq.ft with colorful pictures and green tree, playing equipments for children. High-tech auditorium of seating capacity of 1250 persons spread over 50,000 sq.ft, parking facility for 417 cars and 1026 two wheelers, mini conference hall, amphi theatre and exhibition hall, residential facilities for research scholars, disabled friendly are the prominent features of the library. Exclusive interior decorations, carpet tiles imported from USA spreading 2 lakh sq.ft., interior structural glazing to the extent of 3.5 lakh sq.ft. exterior aluminum composite panels to the extent of 1.5 lakh sq.ft. ACL won the gold certified India’s first green library. Wonderful collection of about 6 lacs books invites not only the Chennai dwellers but also the user community all over India.

## Highlights of Anna Centenary Library

Centrally Located close to IIT Chennai, Anna University and easily accessible at all aspects.

- Unique Braille section, Own book Reading Section
- Ample space for reading with aesthetic comfort for readers providing centrally air-conditioned facility

Exclusive 6 lacs collections on all topics

- World class quality of furniture
- Emergency escape doors, Automated fire alarms, Escalator, cctv, disable friendly

Exciting Kids section with play area, green tree, games and much more.

- Amphitheatre, Auditorium, Conference Hall
- Open an all days of the year ( except 7 days)

### 7. Some of the green elements incorporated at Anna Centenary Library:

#### 7.1.Sustainable sites:

- ❖ The top 20 cm soil during excavation is protected and used for landscape applications.
- ❖ Project is located in a well developed area and has access to all the basic amenities, which channels development to urban areas with existing infrastructure.
- ❖ Project has two nearby bus stops, which encourages the use of Mass transportation system.
- ❖ The project is provided with 341 numbers of car parking spaces, in which 18 car spaces have been earmarked for car/ van pool spaces.
- ❖ 11 number of 15 amp sockets has provided in the parking lot to encourage the use of electric vehicles.
- ❖ Extensive landscape is provided to an area of 6361 Sq.m. to address the heat island effect.
- ❖ Adequate rain water harvesting structures (rain water sump and percolation pits) of capacity 780 m<sup>3</sup> is provided, which ensures the good rain water harvesting and increase in ground water table.
- ❖ A collection well/ sand filter is provided at the lowest point of the site, which helps to remove the sediments from storm runoff moving out of the site.
- ❖ To reduce the heat ingress in to the building, the library terrace area is painted with high albedo paints and green roof is provided to Auditorium terrace and Library terrace level at 1st, 2nd and 3rd floor.
- ❖ Efficient lighting system is designed to ensure there is no light pollution from the project.

## **7.2. Energy efficiency:**

- The project uses high efficient air cooled chillers with COP of 3.11.
- Energy saving heat recovery wheels and Demand control ventilation are provided.
- 75 mm thick over deck roof insulation of extruded polystyrene.
- Achieved a very low lighting power density of 0.71 W/ Sq.ft against 1.3 W/Sq.ft.
- Day light controls for perimeter areas are provided.
- Glazing (DGU) with low Solar Heat Gain Coefficient of 0.2.
- High efficient motors, pumps and fans.
- Project achieved 17.5 % of energy use reduction compared to a standard building.
- CFC and HCFC free HVAC and Fire suppression system.
- Energy and water meters are provided at strategic locations to quantify the energy and water usage.

## **7.3. Indoor Environment Quality:**

- ❖ For improved occupant comfort and well being
- ❖ the project is provided with, increased fresh air
- ❖ of 30% more than the ASHRAE requirements.
- ❖ Smoking prohibited Environment.
- ❖ Only low VOC products (Paints, Adhesives and sealants), CRI certified carpet and MDF & plywood free from urea formaldehyde resins are used in the building.
- ❖ Only eco friendly house keeping chemicals are allowed inside the building premises.
- ❖ Chemical rooms inside the building are provided with deck to deck partitions and negative differential pressure of 5 pas is maintained.
- ❖ DCV system and CO2 sensors are provided in densely occupied areas (more than 25 persons in 1000 Sq.ft.)
- ❖ 15 days building flush out is carried out prior occupancy. MERV 8 filters were used during flush out and MERV 13 filters after flush out.
- ❖ All the equipments and systems are protected from dust and moisture during construction.
- ❖ Entry way mats are provided with minimum 6 feet long in all the main entrances.
- ❖ ACL consumes 30% less energy and 20% less potable water consumption without affecting the indoor condition and occupants comfort.

## **8. About USGBC and LEED:**

The United States Green Building Council has developed LEED, or Leadership in Energy & Environmental Design (from 2000) a green building certification program that recognizes best-in-class building strategies and practices. To receive LEED certification, building projects satisfy

prerequisites and earn points to achieve different levels of certification. Prerequisites and credits differ for each rating system, and teams choose the best fit for their project. The number of points a project earns determines the level of LEED certification. There are four levels of certification - the number of points a project earns determines the level of LEED certification that the project will receive. Typical certification thresholds are: Platinum ( 80+ points), Gold ( 60-79 points), Silver ( 50-59 points), Certified ( 40-49 points).

### **8.1.About IGBC**

The Indian Green Building Council (IGBC), part of the Confederation of Indian Industry (CII) was formed in the year 2001. Different levels of green building certification are awarded based on the total credits earned. However, every Green Existing Building should meet certain mandatory requirements, which are non-negotiable. The threshold criteria for certification/pre-certification levels are as under:

<b>Certification Level</b>	<b>Points</b>	<b>Recognition</b>
Certified	50 – 59	Best Practices
Silver	60 – 69	Outstanding Performance
Gold	70 – 79	National Excellence
Platinum	80 – 89	Global Leadership

The site says, with a modest beginning of 20,000 sq.ft. green built-up area in the country in the year 2003, today (as on August 2014) more than 2,771 Green Buildings projects coming up with a footprint of over 2.23 Billion sq.ft are registered with the Indian Green Building Council (IGBC), out of which 540 Green Building projects are certified and fully functional in India.

### **9. Closing Thoughts**

Creation of a new library cannot be the work of one man, or one firm. It requires the co-operation of a whole team, each member with its own contribution to make” is the conclusion of the well-known librarian and library consultant, Godfrey Thompson. Yes, it’s the collective effort of each and every member of the library. USA leads in developing green libraries, Canada follows, and yet awareness started to spread among other nations too. In Asia, Singapore and India showed their interest but still long way to go. Numerous websites and blogs about green libraries provides ample of information of how libraries can be turned green and ways to achieve it. With limited budgets and resources, Indian libraries strive hard to its maximum to reach the users and going green is another challenge to them. Simple tasks of using low energy, reduction of printing pages, switching off computers when not in use, conserving water, planting green trees around the vacant space at libraries can be followed to save our own valuable resources. A

mass campaign is definitely required among the nation to raise its awareness of constructing not only green libraries but also green buildings.

### Few Pictures of Anna Centenary Library





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### Short Profile of Authors



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She possess more than 10 years of experience in the field of library science. Currently doing research work at Alagappa University, Karaikudi and serving as librarian and information assistant at Anna Centenary Library, Chennai. She has the credit of participation in more than 30 seminars and conferences, presented a dozen of papers and published 11 research articles in various national and international journals. She holds the position of Executive council member of SALIS, Chennai chapter.

#### **Ajit Prabhakaran**



He has 8 years of professional experience. He is presently working as Technical Officer at Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu. He holds B.Sc.; M.Lib. & I Sc. Degree. His area of interest includes Information and Communication Technology (ICT); Research Methodology and Webometrics. He got one book chapter and almost a dozen of research publications in national and international conferences and refereed journals. He is a life time member of ILA (Indian Library Association).