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Green Library: A Path to Sustainable Development

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A B S T R A C T

The emergence of new technologies and instrumentalisation has influenced our lifestyles and increased the risk to the environment, which raised alarm to save the earth. Green design is an emerging trend which not only reduces eco-degradation but also helps in achieving sustainability. Libraries today are not acting as knowledge centres, but they are promoting sustainability and functioning as role models by taking part in the Green Library Movement. This paper gives an overview of a green library and its elements, highlights the standards used to build a green library and explores the initiatives taken to make a library green in India. The paper also provide recommendations to encourage the green library movement and concludes that the librarians should update themselves to actively participate and exemplify the green practices in the library.

Keywords: Green Library, Sustainable Library, Green Library Movement, IGBC, GBCI, LEED, USGBC, Green Library Standards

Introduction

With the development of science and technology, our lifestyles are changing rapidly. The libraries working as knowledge gateways are always in a transition mode where they are accepting new changes and expanding their scope and objectives for providing better services to the society. For the last few years, the green revolution has grown in every sector, including the library. Libraries are now not only serving as knowledge repositories; they are also contributing towards sustainability by providing essential information resources for creating awareness on environmental issues and developing environment-friendly practices in the library. Meher & Patabhoi[1] identified that the green library movement started at the beginning of the 1990s. Green libraries are a part of the green library movement, where they incorporate green features in their layout and design, like the selection of an environmentally friendly site for the library and the use of natural resources in constructing the library building, the conservation of natural resources like water, energy, paper, etc., and the disposal of waste by recycling to build

a sustainable environment. It is also high time for the library professionals to function as a role model for sustainable development in the library by providing accurate information on all green topics, from alternative building practices to renewable energy options, and save the time and money. This can help to balance the ecology and economy and provide an eco-friendly environment in the library.

Concept of Green Library

According to the New World Encyclopaedia, Green Library is a library with environmental concerns in mind. It is also known as the Sustainable Library. The Oxford English Dictionary (2008) defines the word “green” as pertaining to, or supporting, environmentalism. On the other hand, “sustainable” refers to “human economic activity and culture that do not lead to environmental degradation, especially avoiding the long-term depletion of natural resources.” The Online Dictionary of Library and Information Science (ODLIS) defines a green library as “A library designed

to minimise negative impact on the natural environment and maximise household environmental quality by means of careful site selection; use of natural structure materials and biodegradable products; maintenance of resources such as water, energy and paper; and use of a responsible waste disposal recycling system."

Review of Literature

Nowadays there are a number of articles on green libraries, but in the earlier days, articles on green libraries appeared in the 1990s. One such article was by LeRue,[2] which was published in the special section titled "Libraries and the Environment" in the February 1991 issue of the Wilson Library Bulletin. The article elaborated on how to be environmentally supportive at home and in the library.[3] explored the emerging trend of green libraries and mentioned that the libraries were on the cutting edge of green design. The Oregon Library Association dedicated their winter 2007 issue to the topic "Going Green: Libraries and Sustainability". Leadership in Energy and Environmental Design (LEED) accreditation was established by the United States Green Building Council (USGBC) in 2008. Antonelli[4] mentioned the different web pages and websites related to the Green Library Building. Sahavirta[5] stated in an article that commitment to green values may increase the environment.

Vijayalakshmi[6], provided information about the green library initiatives in India and the rest of the world. Chakraborty[7], focused on some important libraries of four metropolises (Kolkata, Delhi, Chennai, and Mumbai) of India and their green initiatives. Naphade, Chani & Garg[8], studied the Central Library building of IIT, Roorkee, and suggested how to make it green. Sornasundari & Sara[9], stated the concept, importance, elements and initiatives of green libraries. Bhattacharyya[10], in his article, mentioned that the Green Library contributes towards maintaining the natural ecological balance in the environment and preserving the planet and its resources. Meher & Patabhoi[1], explained the importance of green libraries and their initiatives in India. Bangar[11], highlighted the Green Library initiatives in India and concluded with some recommendations that can encourage the Green Library movement in India.[12], identified the standards for green libraries in India and the world and the movement in the context of Indian libraries. Gaffar, Sindhu & Kumar[13], in their paper, highlighted the features of green libraries, the role of librarians and green library initiatives in India. Anwar & wei[14], explored the Green Library initiatives throughout the globe and identified the issues and challenges associated with green libraries. Patil & Jani[15], highlighted the Indian initiatives on Green Library and suggested various measures to promote Green Library in India.

Objectives of the Study

- To understand the concept of a green library.
- To explain various elements for greening the library.
- To identify green library initiatives in India.
- To suggest measures to promote the green library movement.

Methodology

The present study is based on qualitative research on collected literature from different sites and reviews according to the objectives of the study. The sources of global and Indian literature on green libraries were examined, analysed and evaluated to reach the objectives of the study and make recommendations.

Limitations of the Study

In recent years, the green library concept has been spreading all around the world, and it is gaining popularity in the field of library and information science. This study is done by collecting information from different sites, databases and journals. An attempt has been made to provide adequate information about Green Library.

International Standards for Green Library

LEED Certification

LEED (Leadership in Energy and Environmental Design) certification is a recognised standard developed and administered by the U.S. Green Building Council (USGBC) to measure and ensure sustainability while designing and constructing new buildings and renovations. It is a rating system that indicates that the building project is genuinely supporting green factors. It guides a builder with certain benchmark standards as to how to design and construct a green building. According to the criteria (green factors) met by the building projects, they are awarded with points called LEED Points. LEED rating systems are of six types – LEED for Building Design and Construction (LEED-BD+C), LEED for Interior Design and Construction (LEED-ID+C), LEED for Building Operations and Maintenance (LEED-O+M), LEED for Neighbourhood Development (LEED-ND), LEED for Residential and LEED for Cities. As enumerated on the U.S. Green Building Council website (https://www.usgbc.org/leed), the LEED certification framework addresses everything from energy and water use to material selection, managing waste and indoor environmental quality through a series of credit categories tailored for each rating.LEED certification has four levels: Certified, Silver, Gold and Platinum. To achieve LEED certification, all prerequisites must be fulfilled by a project, and then points can be earned by selecting and satisfying credit requirements. Projects undergo a verification and review process by the Green Building Certification Institute (GBCI) and are awarded points which decide the level of certification – 40-49 points are required for Certified, 50-59 points for Silver, 60-79

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points for Gold and 80+ points for Platinum.

Chicago Illinois Standards

Chicago is one of the first cities to introduce sustainable practices in constructing public buildings and developed its own standard, which is influenced by the LEED Green Building Rating System.[10]

Brown Green Standard

California Governor Jerry Brown mentioned that the libraries were on the cutting edge of green design. U.S. Green Building Council's LEED Silver Certification or higher certification has to be achieved for new or renovated state buildings over 10000 sq. feet, and clean energy generation must be incorporated.[11]

Indian Standards for Green Library

LEED-India

The U.S. Green Building Council has also established a LEED hub in India. The LEED hub is a local, technical, market, certification and customer support centre for LEED project teams. LEED India is a green building rating system that helps to guide and design high-performance buildings in India. To maintain consistency, the Green Building Certification Institute (GBCI) now manages certification of projects to all LEED rating systems in India, including assuming responsibility for LEED India Certification from the Indian Green Building Council (IGBC). LEED India projects registered with IGBC till June 2014 would be certified by IGBC, whereas the projects registered after June 2014 would be certified by GBCI.

Green Rating for Integrated Habitat Assessment (GRIHA)

TERI (The Energy and Resources Institute, New Delhi) is the organisation that is at the forefront of the Green Building Movement in India. TERI anticipated the need for an indigenous tool for rating green buildings, which gave birth to 'GRIHA'. GRIHA has been accepted as a national rating system for all climatic zones across the country and is applicable to all types of buildings.

IGBC Indian Green Building Council Standard

To promote the concept of green buildings in India, the Indian Green Building Council was formed in 2001 initially as a part of the Confederation of Indian Industry (CII) to promote and rate 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."

Green Library Elements

LEED India promotes a whole-building approach to sustainability by recognizing performance in the following five areas:

Choice of Site

India has a geographically varied location, like high hill top to plains, from deserts to vast coastal areas with a variety of climatic conditions where one norm cannot fit for all the locations of the country. The library should be located in a densely populated area, near other service-related buildings but away from the noise zone to make the user concentrate on their study. Proper site selection should be in such a way that people could access the library building easily via public transport with the facility of a parking lot. Preferences in the parking should be given to energy-efficient vehicles. The heat can be reduced by introducing a vegetable roof or by shading hard surfaces or putting them underground.

Water Conservation

There are many ways for libraries to conserve and make the best use of water by using rainwater harvesting systems, low-flow fixtures and waterless urinals. Libraries can reuse the wastewater and rainwater for plantation, gardening or flushing in toilets. Libraries should design the sewage system in their building which uses wastewater or non-potable water. A water tank could be designed in such a way that it can store rainwater, recycle greywater or treat water for sewage conveyance.

Energy Conservation

Nowadays energy consumption is unavoidable; only it can be reduced or saved through various measures. A library building can be designed with enough windows, glass windows, natural lighting, energy-efficient bulbs, etc., to save energy. Solar panels placed on the rooftop of the library building can generate power by converting sunlight into electricity. Wind turbines installed on a tower can also generate electricity better suited for libraries in rural and non-urban areas. Alternative sources of electricity, such as solar and wind power, can be utilised in the library to reduce energy consumption.

Building Materials

There are numerous standards and protocols available in India and outside for constructing green buildings for the library using recyclable and environmentally sustainable

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materials. IGBC (Indian Green Building Council), a part of CII (Confederation of Indian Industry), offers green building rating programmes, training programmes, certification service programmes, etc. LEED (Leadership in Energy and Environmental Design) is an internationally recognised programme for designing environmentally compatible green buildings for a sustainable environment. For building Construction libraries must choose materials that produce the least amount of waste and prevent environmental damage. Sometimes use of locally available materials can save the cost and pollution in transportation.[16]

Indoor Air Quality

Proper ventilation in the library building is required for good air quality. Planned air ventilation reduces the electricity consumption. Proper plantation around the building is required to get clean and fresh air. Indoor plants like spider plants, aloe vera, Boston ferns, and English Ivy can be used for quality air within the library. Plantation of trees in a campus can reduce the use of air conditioning. On the other hand, buildings in the mountain areas should be in a sunny location, which can reduce the use of room heaters and blowers and save money. Green buildings must be designed in such a way that the air is recycled rather than

Table 1.Overview of Green and Sustainable Libraries in India

Name of the Library	Place	Features
Anna Centenary Library	Chennai	Equipped with modern technology with proper use of light, air and wood. Asia's first LEED Gold rated building.
Calcutta University Library	Kolkata	Great height, vast open areas, thick walls, windows all through the eastern wall, terminals connected through local network with a server, OPAC, access to 7000 plus electronic journals, various databases, books, theses, dissertations
Delhi University Library	Delhi	The old building provides naturally cool and pleasant environment with broad opening for natural lights. Too many large windows accelerate both fresh air and sunlight. Provides 64 high quality database accessibility, innovative Information Literacy Programs in the library.
Karnataka University Library	Dharwad	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 - facilitate the Gurukul System.
Madras University Library	Chennai	The windows are designed in a manner that ensures proper lighting of the reading area and the circulation of fresh air.
Mumbai University Library	Mumbai	Using environment-friendly products and ensures proper lighting, providing open spaces for the readers.
National Library of India	Kolkata	The library is built in an impressive structure with Roman beams, tall Corinthian pillars, white roofs, and arches. The white building is decorated with red doors and windows. Various small trees, green grass, and various statues have been arranged like a park on the facade of the library building for enhancing the beauty of this library.
National Institute of Technology	Silchar, Assam	NIT Silchar Library new building under construction is designed according to LEED certification system of U.S which can be the role model for developing green libraries in Barak Valley. It is perhaps the first initiative in North East Region in India.
Perma Karpo Library	Ladakh	Solar panels, surrounded by white lotus garden, innovative technologies.

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being stagnant.[16]

Green Library Initiatives in India

India is on the list of top countries in Leadership in Energy and Environmental Design (LEED) outside India, according to the latest US Green Building Council report. In India, many libraries have started implementing green provisions in their libraries to achieve sustainability. Some of the libraries are listed in Table 1.

Challenges associated with Green Library

The advent of ICT and its associated tools is influencing the lifestyle of an individual library along with the patrons, which brings a huge change in the behavioural pattern of the users and damages the environment rapidly. Information explosion in the modern age is another big issue. Environmental issues like heavy sunlight and ultraviolet rays can damage the resources of the library. Thus, proper measures should be taken by the library to reduce the energy consumption and water conservation and increase the use of natural structural materials and biodegradable products to maintain a sustainable environment in the library..

Recommendations

Libraries can use a variety of tools and techniques to establish the green concept and educate the patrons through library exhibitions and publications to maintain a green and sustainable environment in the library. In India, the government can promote green libraries by providing financial support and encourage the existing green initiatives by providing awards and rewards. The University Grants Commission can encourage the colleges and universities to take initiative to convert libraries into green libraries wherever possible. The libraries can arrange planning sessions to ensure sustainability. Small practices and initiatives like turning off the lights when not required, using printers with standby energy mode, and placing sensors among the stacks can help to reduce the energy consumption in the library. The library can introduce waste management techniques by recycling returnable beverage containers, using individual waste baskets (one for trash and the other for paper), and by recycling the paper waste.

Conclusion

Green Library, also known as Sustainable Library, is a modern library that conducts its operation in an environmentally friendly and more cost-effective manner.Greening the library is nowadays one of the most significant efforts. Thus, librarians should take necessary efforts to green their libraries as well as take part in the Green Library Movement. Many national and international organisations are offering assistance to make the libraries eco-friendly. The library professionals, library users and the government can collectively take action to save the valuable natural resources, sustain the environment and actively participate in the Green Library Movement.

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