JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

GREEN LIBRARY: A STEP TOWARDS SUSTAINABLE FUTURE

Dr. Kanak Jayeshbhai Kasundra
Librarian, H. & H. B. Kotak Institute of Science, Rajkot, Gujarat, India

Abstract : Green design has emerged as a defining trend for 21st-century libraries, giving rise to the Green Library Movement, which involves librarians, libraries, educational institutions, and communities committed to reducing environmental degradation. The concept of green libraries focuses on sustainable building design, eco-friendly operations, efficient use of resources, and environmental education. This movement recognizes libraries as important institutions that can model sustainable practices and promote environmental awareness. The paper highlights the conditions and features of green libraries, the role of librarians, and green library initiatives in India. It emphasizes that environmental challenges such as energy depletion and climate change are reshaping the types of information resources, services, and programs libraries offer to their communities. In India, the green library trend is expanding across the country, with increasing adoption in academic, public, and special libraries.

IndexTerms - **Green Library, Sustainable library**

1. Introduction:

In the 21st century, rapid urbanization, industrialization, and technological growth have intensified environmental challenges such as energy depletion, climate change, and resource scarcity. Libraries, as centers of knowledge and community engagement, play a crucial role in promoting sustainability. A green library is designed and managed to minimize environmental impact through energy-efficient buildings, water conservation, waste reduction, digitization, and eco-friendly operations. The concept of green libraries first emerged in the early 1990s and gained notable attention in the field of librarianship by the early 2000s. The establishment of the **U.S. Green Building Council (USGBC) in 1993** and the introduction of **LEED (Leadership in Energy and Environmental Design) certification in 2000** provided standards for sustainable library buildings. As Singh and Dixit (2021) note, green libraries include the construction of sustainable buildings, the greening of existing facilities, the provision of environmentally friendly services, and the adoption of practices that promote sustainability within the library environment.

Today, worldwide many libraries are implementing green practices to create environment friendly spaces. A green library can integrate advanced technologies in building design and service delivery to provide a sustainable environment for its users. Public libraries, in particular, serve as life-long learning centers for

all community members. Beyond being repositories of knowledge, libraries educate the public about environmental concerns through their collections, sustainable facilities, and public programs. Green libraries not only reduce their carbon footprint but also raise awareness about environmental responsibility, foster understanding of climate change by integrating sustainable practices, libraries serve as both examples and educators, contributing to a greener and more sustainable future. In essence, a green library is designed, built, operated, and maintained in an environmentally responsible and sustainable manner, while also promoting environmental awareness among its users.

2. Definition:

The **Oxford English Dictionary** (2008) defines the word "green" as "relating to or advocating environmentalism". The term "sustainable" refers to "human economic activities and forms of culture that do not degrade the environment, i.e. avoid the long-term depletion of natural resources".

According to the **Online Dictionary of Library and Information Science (ODLIS),** "Green Library as a sustainable library is defined as a library considered to decrease adverse effects on the natural environment and to take benefit of the environmental superiority of the building through careful site selection, natural building materials, and natural building materials. Conservation of resources like recyclable products, water, energy, paper and responsible waste disposal recycling etc."

According to the **New World Encyclopedia**, a 'green library', or a 'sustainable library', is "a library considered with environmental awareness."

In a simple words, "A green library is a library that minimizes its environmental footprint while educating and inspiring people to live sustainably." Libraries are designed to minimize negative impacts on the natural environment and maximize the indoor environment by using natural, quality building materials and biodegradable products, resource conservation (water, energy, paper) through careful site selection, responsible waste, disposal, recycling, etc.

3. Objective:

Major Objective of this study is to understand the importance and elements of green library concept. Other objective is to observe the initiatives taken at the international and national level towards the green library technology to understand various techniques and methods to promote green library movement.

4. Components of Green Technology Applied to Libraries:

A **green library** is an environmentally sustainable library designed, built, and operated to minimize negative environmental impact while promoting sustainability, health, and environmental awareness. It integrates **green building principles, energy-efficient technologies,** water conservation and waste reduction, **eco-friendly services and usage of sustainable material** while also serving as an **educational center for sustainable living**.

1. **Energy Efficiency**:

   Smart lighting systems: Occupancy sensors and daylight harvesting reduce unnecessary lighting.

   Renewable energy sources: Solar panels generate clean energy and reduce dependence on fossil fuels.

Efficient heating and cooling: Energy-efficient HVAC systems, radiant heating/cooling, and smart thermostats optimize energy use.

2. **Green Building Design and Materials:**

   Passive solar design: Maximizes natural light while controlling heat gain through insulation and window placement.

   Green roofs and landscaping: Vegetated roofs improve insulation, manage rainwater, and reduce urban heat.

   Sustainable materials: Use of recycled, locally sourced, non-toxic materials such as bamboo, FSC-certified wood, and low-VOC paints.

3. **Water Conservation:**

   Rainwater harvesting: Collected rainwater is used for irrigation and toilet flushing.

   Water-efficient fixtures: Low-flow taps and dual-flush toilets reduce water consumption.

   Greywater systems: Reuse of wastewater from sinks for landscaping and non-potable purposes.

4. **Waste Reduction and Recycling:**

   Digital resources: E-books, online databases, and digital journals reduce paper use.

   Recycling programs: Clearly labeled recycling bins for paper, plastic, and glass.

   Repurposing materials: Creative reuse of old books and materials through workshops.

   Wastewater treatment (STP): Treated wastewater reused for gardening and cleaning

5. **Eco-Friendly Operations:**

   Use of **green cleaning products,** environmentally responsible purchasing and reduced use of harmful chemicals

6. **Community and Educational Initiatives:**

   Educational programs: Workshops, lectures, and exhibitions on sustainability and climate change.

   Sustainable collections: Books and resources on environmental studies and green practices.

   Seed libraries: Patrons borrow seeds to promote gardening and biodiversity.

   Partnerships: Collaboration with environmental organizations and government agencies.

A green library goes beyond being a sustainable building—it is a **center for environmental responsibility**, combining eco-friendly infrastructure, efficient resource management, and community education. By adopting green technologies, libraries contribute significantly to **environmental protection, cost savings, and public awareness,** making them vital institutions for a sustainable future.

5. **IFLA Guideline for Green Library:**

The International Federation of Library Associations and Institutions (IFLA) promotes green libraries through its ENSULIB (Environment, Sustainability and Libraries) Section, encouraging libraries to play a leading role in environmental sustainability and education. IFLA guidelines emphasize the adoption of sustainable library buildings, efficient use of energy and water, and environmentally responsible operations such as green procurement, waste reduction, recycling, and digitization. Libraries are encouraged to develop sustainable collections and services, provide access to environmental information, and promote digital

resources to reduce paper consumption. A key focus is on environmental education and awareness, achieved through workshops, exhibitions, and information literacy programs. IFLA also highlights community engagement and partnerships, positioning libraries as hubs for local sustainability initiatives. Overall, IFLA aligns green library practices with the United Nations Sustainable Development Goals (SDGs) and supports global efforts through initiatives such as the IFLA Green Library Award, recognizing libraries that demonstrate leadership in sustainability and environmental responsibility.

6. Indian Standards for Green Library:

India does not have a separate, library-specific green standard, but green libraries in India follow national building, energy, and sustainability standards applicable to public buildings. These standards guide libraries in adopting environmentally responsible construction and operations.

The National Building Code of India (NBC) issued by the Bureau of Indian Standards (BIS) provides guidelines for sustainable building design, natural lighting, ventilation, and energy efficiency, which are followed in green library construction. The GRIHA (Green Rating for Integrated Habitat Assessment) rating system, developed by TERI and adopted by the Government of India, is the most important green building assessment framework, encouraging libraries to improve energy efficiency, water conservation, waste management, renewable energy use, and site planning. The Energy Conservation Building Code (ECBC) issued by the Bureau of Energy Efficiency (BEE) focuses on reducing energy consumption through efficient lighting, HVAC systems, and electrical infrastructure. Additionally, the Indian Green Building Council (IGBC) under CII offers green building certification for new and existing library buildings, emphasizing sustainability in both construction and day-to-day operations.

Together, these standards help Indian libraries function as environmentally sustainable and energy-efficient public institutions.

7. Indian Library Initiatives Promoting Green Library Concepts:

Several libraries in India actively promote **green library concepts** by adopting eco-friendly infrastructure, energy conservation, digitization, and sustainability practices, even though India does not have a separate green library standard.

The **Anna Centenary Library, Chennai**, one of Asia's largest libraries, follows energy-efficient building design, makes maximum use of natural lighting, and promotes digital resources to reduce paper consumption. **IIT libraries** across campuses such as Delhi, Bombay, Madras, and Kharagpur use solar energy, energy-efficient systems, and extensive digitization, with many campus buildings compliant with **GRIHA and IGBC standards**.

The **Indian Institute of Science (IISc) Library, Bengaluru** emphasizes energy and water conservation and provides strong access to digital resources within a sustainable campus environment. **IIM libraries** integrate green campus initiatives, eco-friendly infrastructure, and reduced paper usage through digital services. The **Delhi Public Library** promotes digitization, online services, and environmental awareness programs, while the **National Library of India, Kolkata** undertakes digitization and resource conservation using environmentally safe preservation methods.

Many **central and state university libraries** (such as JNU, DU, and University of Hyderabad) adopt rainwater harvesting, solar lighting, and e-resources through INFLIBNET and N-LIST. The **TERI Knowledge Resource Centre, New Delhi**, stands out as a model green information center with a strong focus on sustainability, climate, and energy research.

8. Conclusion:

Libraries can adopt green practices through simple, cost-effective, and sustainable measures in their daily operations and services. Energy efficiency can be improved by using LED lighting, energy-efficient appliances, automatic sensors for lights and fans, and installing solar panels or other renewable energy sources. Sustainable building design includes maximizing natural light and ventilation, using eco-friendly and locally available materials, and adopting green roofs or vertical gardens to improve insulation. For water conservation, libraries should install rainwater harvesting systems, use low-flow taps and toilets, and reuse water for gardening and cleaning purposes. Waste management practices include segregating waste into dry, wet, and e-waste, recycling paper and plastics, and reducing printing by using digital notices and e-circulars.

Digitization and paper reduction play a major role through the promotion of e-books, e-journals, online databases, and paperless communication. Environmentally responsible operations involve using non-toxic cleaning products, sustainable furniture, and green procurement policies. Finally, libraries should promote environmental awareness and community engagement by organizing sustainability programs, celebrating environmental days, developing green collections, and collaborating with schools, NGOs, and local bodies for activities such as tree plantation and recycling drives.

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