International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Community Centres of The Future: Green Libraries, Ergonomic Design and Social Sustainability

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Abstract

A community centre with a green library management system and ergonomic design is a holistic approach to creating a sustainable, user-friendly, and eco-friendly knowledge hub. A community centre with a modern library is a shared environmentally conscious public space that combines traditional library services with community-centred activites and amenities. This paper highlights the key features of a modern library in a community centre accompanied by the green library setup that includes sustainable building materials, eco-friendly shelving and furniture, energy-efficient systems, waste reduction, water conservation, improved indoor air quality, flexible and adaptable layout or design, community engagement and education, universal accessibility, digital collections and resources, comfortable seating, adjustable lighting, acoustic comfort. The present paper also discusses the economic benefits, social benefits, operational benefits, and technological benefits of green library management system. Green libraries aim to promote holistic community hubs while executing sustainable practices and providing a healthy, comfortable, and productive learning environment for users and staff.

Keyword: green library, ergonomic design, eco-friendly, sustainability, inclusivity

Abbreviation(s) HVAC (Heating, Ventilation, and Air Conditioning), LEED (Leadership in Energy and Environmental Design), ASHRAE (American Society of Heating, Refrigerating and Air-conditioning Engineers)

1. INTRODUCTION

A community centre with a green library management system and ergonomic design is a holistic approach to creating a sustainable, user-friendly, and eco-friendly knowledge hub. A community centre with a modern library is a shared environmentally conscious public space that combines traditional library services with community-centred activites and amenities. Holistic community spaces are designed to promote physical, emotional, and mental well-being. By incorporating natural building materials, integrating green libraries and ergonomic design, and laying out inclusive and accessible spaces, it is possible to create vibrant, thriving knowledge hubs that support the needs of users. These can foster a sense of community, support learning, and promote sustainability. This paper highlights the key features of a modern library in a community centre accompanied by the green library setup that includes sustainable building materials, eco-friendly shelving and furniture, energy-efficient systems,

waste reduction, water conservation, improved indoor air quality, flexible and adaptable layout or design, community engagement and education, universal accessibility, digital collections and resources, comfortable seating, adjustable lighting, acoustic comfort. The present paper also discusses the economic benefits, social benefits, operational benefits, and technological benefits of green library management system. Green libraries aim to promote holistic community hubs while executing sustainable practices and providing a healthy, comfortable, and productive learning environment for users and staff.

2. Objectives

The main objectives of community centres integrated with green libraries and eco-friendly ergonomic desings are:

1. To encourage users and staff to adopt sustainable practices and behaviours, promoting a culture of sustainability within the library and the broader community;
2. To provide resources, programs, and services that support environmental education and research;
3. To literate users about sustainable practices, climate change, and environmental control;
4. To implement energy-efficient systems, lighting, and equipment to minimize energy consumption;
5. To ensure good air quality, thermal comfort, and natural light to promote user health and well-being;
6. To design collaborative and flexible spaces that encourage social interaction, learning, and community engagement;
7. To ensure that the library is accessible and inclusive for all users, regardless of age, ability, or socioeconomic status;
8. To implement energy-efficient systems, reduce water consumption, and minimize waste to reduce operating costs; and
9. To demonstrate the library's commitment to sustainability and social responsibility, enhancing its reputation and attracting users and other stakeholders.

3. What is community centre?

A community centre is a public place or facility that provides a shared space for community members to gather, socialize, and participate in various activities. These centres often serve as hubs for community engagement, socialization, and development.

4. Designing all-inclusive community centres

All-inclusive or holistic community centres ensure access to to natural light, green spaces, and comfortable seating can reduce stress and anxiety. Shared spaces can foster social connections, a sense of belonging, and community integration. Community centres help to promote increased community engagement. Green libraries and ergonomic design can improve concentration and integrated learning outgrowth. Implementing technology-enhanced environments, eco-friendly energy resources, and sustainable building materials can reduce environmental impact.

4.1 Green libraries

A green library is a library that incorporates eco-friendly and sustainable practices into its designs, operations, and services. The goal of the green libraries is to minimize its environmental impact and promote sustainability within the community it serves. Green Libraries can serve as models for

sustainable design and operations, and can present a unique opportunity for libraries to promote environmental awareness and sustainability within their communities.

Some common features of the green libraries include:

- Sustainable materials: Incorporating recycled, recyclable, and sustainable materials into the building's design and furnishings;
- Energy-efficient design: Using natural light, solar panels, and energy-efficient lighting and HVAC systems;
- Waste reduction and recycling: Implementing recycling programs, composting, and minimizing waste;
- Indoor air quality: Using non-toxic and low-VOC (volatile organic compound) materials, and incorporating air-purifying plants;
- Water conservation: Implementing rainwater harvesting systems and low-flow plumbing fixtures;
- Sustainable resources: Developing library resource collections that promote sustainability, such as e-books, digital media, and materials on environmental topics;
- Community engagement: Offering programs and services that promote sustainability and environmental awareness within the community;
- Green technologies: Incorporating green technologies, such as energy-efficient devices (like smart board, overhead projectors, computers), smart building systems and solar-powered charging stations.

4.2 Ergonomic design

Ergonomic designs in green libraries deal with creating products, systems, and environments that are comfortable, safe, and efficient for users. Here are some key features:

- Providing comfortable workspaces and seating arrangements, including ergonomic furniture and adequate lighting, promotes user comfort and learning productivity.
- Designing workable and adaptable spaces allows for different types of activities and events, reducing the need for separate rooms.
- Comprising acoustic design elements, such as sound-absorbing materials and quiet rooms, creates a peaceful and distraction-free environment.

Ergonomic design in green libraries focuses on creating a comfortable, sustainable, and user-centered environment. By incorporating the following principles, green libraries can create ergonomic and sustainable settings that ensure the well-being and success of their users. Here are those principles:

a) User-centered design

- Design spaces that accommodate varied user needs and abilities.
- Conduct user research to inform design decisions.

b) Sustainability and energy efficiency

- Incorporate eco-friendly materials
- Enhance natural light and ventilation
- Implement energy-efficient lighting

c) Comfort and well-being

- Furnish adjustable and ergonomic furnishings
- Ensure adequate air quality and temperature control
- Include comforting elements, such as plants and natural materials

d) Flexibility and adaptability

- Upgrade spaces that can adapt to changing user needs
- Incorporate sophisticated and movable equipments
- Make use of mechanisms to support flexible learning and work environments

e) Moderation and simplicity

- Reduce untidiness, disarray and remove unnecessary elements
- Achieve a graceful, quiet and distraction-free surroundings
- Ensure user-friendly design

f) Accessibility and inclusivity

- Arrange spaces that are accessible and usable by all users
- Plan accessible technology, digital resources and easy-to-use interfaces
- Lay out accommodations for users with disabilities

g) Maintenance and preservation

- Architecture space arrangements with easy maintenance and upkeep in mind
- Use materials and machineries that are durable and easy to clean
- Execute sustainable maintenance practices

4.3 Integral and accesible design

Integral and accessible design in community centers and green libraries ahead can greatly promote the user experience, achieve social inclusion, and bring up a sense of community. Here are some key considerations:

1. Design community centers and libraries with flexible, multifunctional spaces that can accommodate various activities, events, and user needs.
2. Ensure that all areas are wheelchair accessible, with features like ramps, elevators, and adaptable restrooms.
3. Incorporate smart technologies, like hearing loops or audio induction loop systems, braille presentations, and accessible digital interfaces.
4. Incorporate elements that cater to diverse sensory needs, such as quiet areas, natural light, and tactile materials.
5. Incorporate adjustable, ergonomic furniture that accommodates different ages, abilities, and body types.
6. Offer programs and services that cater to diverse needs, such as language classes, cultural programs, and disability support groups.
7. Provide accessible storage options, like lowered shelves and easy-to-use cabinets.
8. Design community centers and libraries with flexible infrastructure that can adapt to changing community needs and technological advancements.
9. Implement energy management systems, smart lighting, and intelligent security systems.
10. Upgrade with virtual and augmented reality technologies to increase experiences of the users' community and provide them innovative learning environments.

4.4 Social sustainability

Social sustainability is a means of configuring civilisation and human activity so that society, its members and its economies are able to meet their needs and express their greatest potential in the present, planning for the ability to maintain the necessary resources for future generations. Social

sustainability is achieved through the community engagement, fostering strong relationships between community members, organizations and institutions. This is facilitated through collaborative governance, engaging community members, organisations, and institutions in decision-making processes. It values inclusivity and equity, ensuring that all community members have access to resources, services, and opportunities.

5. Range of services and programmes offered by community centres

Community centres typically offer a range of services and programmes, including:

1. Educational programmes: Workshops, training sessions, and classes on various topics, such as literacy, job skills, and health.
2. Recreational activities: Sports, fitness classes, dance lessons, and other leisure activities.
3. Community events: Meetings, conferences, festivals, and other events that promote community cohesion and celebration.
4. Youth acitivities: After-school activities, leadership, mentorship, and character development for children and teenagers.
5. Social services: Assistance with basic requirements, support teams, counselling.
6. Health and well-being: Fitness classes, health check-ups and access to health resources and services.

6. Examples of community centres and green libraries in India

Here are some unique aspects and examples of community centres and green libraries in India:

Community centres

1. Kolkata Community Centre (Kolkata): A community centre provides a platform for social inclusion, cultural preservation, recreational facilities, educational programs, skill development and social services.
2. India Habitat Centre (New Delhi): A community centre with conference facilities, art galleries, and a library, focusing on environmental and social issues.
3. Nehru Centre (Mumbai): A community centre with auditoriums, art galleries, and a library, promoting cultural and educational activities.
4. The Community Centre (Bangalore): A community centre providing recreational facilities, cultural events, and social services.

Green libraries

1. The National Library (Kolkata): A green library with a verdant leafy green campus, using rainwater harvesting and solar panels.
2. The Indian Institute of Technology (IIT) Bombay Library (Mumbai): A green library with a sustainable design, using natural light and solar panels.
3. The Anna Centenary Library (Chennai): A green library with a sustainable design, using natural light and solar panels.
4. The British Council Library (New Delhi)**:** A green library with a sustainable design, using natural light and solar panels.

Community centres with green libraries

1. The India International Centre (New Delhi): A community center with a green library, focusing on cultural and intellectual activities
2. The Library Community Centre at the Tata Institute of Social Sciences (TISS) Hyderabad,

Telangana.

3. The Green Community Centre at the Indian Institute of Technology (IIT) Gandhinagar, Gujarat.
4. The Bangalore International Centre (Bangalore): A community center with a green
5. library, promoting cultural and intellectual activities.

Table 1: Steps to implement Community Centres

Serial No.	Step	Description
1.	Needs Assessment and Planning	i. Conduct a needs assessment to identify community needs and priorities. ii. Setup a planning committee having community leaders, experts, and local stakeholders. iii. Formulate a comprehensive plan including budget, timeline and resource allocation.
2.	Site Selection and Ergonomic Design	i. Select a suitable site for the community centre, considering accessibility, safety and visibility. ii. Engage planners, designers and architectural engineers to create a sustainable, energy-efficient design. iii. Ensure the design consisting of green building features, for example, natural lighting, ventilation and insulation.
3.	Funding and Partnership	i. Explore funding opportunities including government grants, community fundraising and sponsorship. ii. Design a financial sustainability plan, including revenue and expense management. iii. Setup partnerships with government agencies, local organisations etc.
4.	Construction and Infrastructural Development	i. Install energy-efficient systems including rainwater harvesting, solar panels etc.

		ii. Engage contractors and developers to build the community centre. iii. Introduce IT enhanced enviornment with highly configured computers, high speed internet and digital resources.
5.	Programming and Services	i. Design programmes and services including education, recreation, health and social services. ii. Engage efficient staffs and volunteers to provide services.
6.	Starting and Evaluation	i. Start functioning of the community centre and evaluate programmes and services using feedback from community users. ii. Continuous updation.

Table 1: Steps to implement sustainable Green Library

Serial No.	**Step**	**Description**
1.	Needs Assessment and Planning	i. Conduct a needs assessment to identify community needs and priorities.
2.	Site Selection and Ergonomic Design	i. Identify an appropriate site for the library, keeping in mind safety, accessibility, visibility etc. ii. Create a sustainable, energy-efficient ergonomic design. iii. Make sure the design comprises of green building features such as natural light, soundproofing materials, ventilation and insulation.
3.	Collection Development and Digital Resources	i. Develop a varied collection of print and digital resources including e-books, e-journals, online databases etc. ii Establish inter library lending to share resources. iii. Impelement information

		literacy programme to proper or fair use of materials.
4.	Technology and Infrastructure Development	i. Introduce IT enhanced enviornment with highly configured computers, high speed internet, wi-fi and digital resources. ii. Introduce accessibility and inclusivity in library technology and IT based architectural design such as harware & software, network infrastructure.
5.	Programming and Services	i. Design programmes and services including eco-friendly book stacks; ergonomically arranged surfing zone, digital repository, reading area, rest & recreation zone, virtual seminar room. ii. Engage efficient librarians and support staffs to provide specialised services.
6.	Starting and Evaluation	i. Start functioning of the library, evaluate programmes and services using feedback from community users. ii. Continuous updation, development of user-friendly integrated library systems and its periodical evaluation.

7. The IFLA guidelines for green libraries

The International Federation of Library Association and Institutions (IFLA) provides guidelines for green libraries, focusing on sustainability and environmental education. The IFLA guidelines for green and sustainable libraries provide concrete recommendations and best practices for libraries of any size and type. These guidelines aim to support libraries in reducing their environmental impact and promoting sustainability.

Some key aspects of the guidelines include:

- Sustainable buildings, equipments and management: A checklist for libraries to assess their sustainability performance.
- Environmental education: Providing resources and programs that promote envirnmental awareness and education.

- Community engagement: Encouraging community participation in sustainablity initiatives and environmental activities.

Additionally, IFLA offers the green library award, which recognizes libraries that have made significant contributions to sustainability and environmental education. The award evaluation criteria include factors like the library's budget, project impact, and community engagement.

8. International Standards and Guidelines of Community Centres

The international standards and guidelines provide a framework for designing, operating, and managing community centres that are safe, accessible, sustainable and inclusive. Here are some International standards and guidelines related to community centres:

Building and Design Standards

1. International Building Code (IBC): Published by the International Code Council (ICC), this code provides minimum requirements for building design, construction, and safety.
2. International Organisation for Standardisation (ISO) 21542: Specifies requirements for accessibility in buildings, including community centres.
3. Americans with Disabilities Act (ADA) Standards: Guidelines for accessible design in community centres.

Sustainability and Energy Efficiency

1. Leadership in Energy and Environmental Design (LEED): A green building rating system that can be applied to community centres.
2. International Organisation for Standardisation (ISO) 14001: Environmental Management System (EMS) standard for community centres.
3. ASHRAE Standard 90.1: Energy efficiency standard for buildings, including community centres.

Safety and Security

1. ISO 31000: Risk management standard for community centres.
2. National Fire Protection Association (NFPA) 101: Life safety code for community centres.
3. ICC Security Guidelines: Guidelines for security design in community centres.

Operations and Management

1. ISO 9001: Quality management standard for community centres.
2. International Association of Public Parks and Recreation (IAPPR) Standards: Guidelines for community centre operations and management.
3. National Recreation and Park Association (NRPA) Standards: Standards for community centre operations, maintenance and management.

Accessibility and Inclusion

1. United Nations Convention on the Rights of Persons with Disabilities (CRPD): Guidelines for accessibility and inclusion in community centres.
2. ISO 14289: Specifies requirements for accessibility in information and communication technology (ICT) in community centres.
3. World Health Organisation (WHO) Guidelines: Guidelines for accessibility and inclusion in community centres.

8.1 International Standards and Guidelines of Green Libraries

The international standards and guidelines provide a framework for designing, operating, and maintaining green libraries that are ergonomically designed, environmentally sustainable, energy

efficient, and socially responsible. Here are some international standards and guidelines related to sustainable green libraries:

Building and Design Standards

1. Leadership in Energy and Environmental Design (LEED): A green building rating system that can be applied to libraries.
2. ISO 14001: EMS standard for libraries.
3. ISO 21542: Specifies requirements for accessibility in building libraries.

Sustainability and Energy Efficiency

1. Green Globes: A green building rating system that can be applied to libraries.
2. International Organisation for Standardisation (ISO) 50001: Energy management standard for libraries.
3. ASHRAE Standard 90.1: Energy efficiency standard for buildings, including libraries.

Water Conservation

1. ISO 14046: Specifies requirements for water footprinting in libraries.
2. Water Sense: A water conservation programme that can be applied to libraries.

Waste Management and Recycling

1. ISO 14021: Specifies requirements for environmental labels and declarations in libraries.
2. Zero Waste International Alliance (ZWIA): Guidelines for zero waste in libraries.

Indoor Air Quality and Ventilation

1. ASHRAE Standard 62.1: Ventilation standard for buildings, including libraries.
2. ISO 16000: Specifies requirements for indoor air quality in libraries.

Materials and Resources

1. ISO 14024: Specifies requirements for environmental labels and declarations in libraries.
2. Forest Stewardship Council (FSC): Certification for sustainable forestry practices in libraries.

Operations and Maintenance

1. ISO 14001: EMS for libraries.
2. International Association of Public Parks and Recreation (IAPPR) Standards: Guidelines for sustainable library operations and maintenance.

Additional Resources

1. IFLA Green Library Guidelines: Guidelines for sustainable library design and operations.
2. American Library Association's (ALA) Sustainablity Committee: Resources and guidelines for sustainable libraries.
3. Sustainable Libraries Initiative: Guidelines and resources for sustainable library design and operations.

9. Conclusion

In conclusion, the community center of the future, green library, and social sustainability are interconnected concepts that prioritise inclusivity, sustainability, and community engagement. By embracing these concepts, it is possible generate thriving, resilient communities that promote social, environmental, and economic well-being. The community centre of the future prioritises accessibility and inclusivity, providing a welcoming space for diverse community members.The community centre of the future uses technology to enhance community engagement, provide innovative services, and foster social connections. The green library features an eco-friendly design that minimizes environmental

impact, reduces energy consumption, and protmotes sustainability. It serves as a community hub, offering a shared space for education, socialisation and community participation. It can also prioritise sustainable collections, incorporating digital resources, reducing paper usage, and promoting eco-friendly publishing practices.

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