

Full Length Research

Green library movement: novelty for Nigerian library development

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This paper is on green library movement that focuses attention on green library building which is concerned with the use of sophisticated building materials and biodegradable technology to improving the indoor quality and resources of the library and its services. In this paper, attention is on: the concept of green library building; the structural components of the building and the resources; the increasing use of natural energies as tools to exploiting and improving the interior quality of the library building and information resources; how the green library improves human health as a contribution to reducing the harmful impact of global warming and climatic changes on earth depletion; the benefits of green library in addressing environmental issues using natural energies; the processes for green library development in Nigeria among others.

Key Words: Biodegradables, Earth Depletion, Green Library, Interior quality.

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INTRODUCTION

The global rising in human population, industrialization and the technological advances have been identified as factors responsible for the proliferation of the negative impacts of global warming, climatic changes and human inability to maintain a sustainable safer environment and the resultant effect on earth depletion. The advents of these negative environmental influences on our planet and the efforts by man to salvage the earth, have created a number of sustainable drive initiatives of which the green building movement now growing across the globe, is one. Basically, Green Building Movement was developed by the Green Building Council (GBC) in the United States of America, using Leadership in Energy and Environment Design (LEED) rating systems. LEED is

a standard design operating system for the construction of green buildings. As a rating system, LEED is now a green certificate program used worldwide for most building construction frameworks to save money, improve energy efficiency that lower carbon emissions and create healthier dwellings for human habitation.

Ultimately, Green Building Movement is a process for resource efficient and ecological friendly construction practice that focused on reduced human harmful impacts and increased positive influences on the environmental buildings. It is part of the global initiative to save the planet earth from the threat of increasing global warming and environmental degradation. Wikipedia (2022) advanced that the basic aim of the green building movement is to reduce the inclusive effect of the built environment on human well-being and the natural

environment by efficiently using energy, water and other resources to protect the dwellers' health, and improve productivity through waste reduction, pollution and other environmental degradation. The sustainability of these drives have being the core concern of most international conferences on the planet earth as a solution to achieving other factors to salvage the planet from global warming, climatic changes and total earth depletion.

United Nations Earth summits have also emphasized the importance and need for reconciling economy, technology and the environment as major issues and projects of concerned interest in salvaging the environmental crisis from worsen through certain agreed sustainability goals. The term sustainability as used here is an all-inclusive systematic initiatives geared toward maintaining certain level of the developmental needs and in protecting the environment without forfeiting the capacity of meeting the needs of the present and the oncoming generation. The University of California (2022) asserted that sustainability is the efficient balance between environment, equity, the economy and technology trend. Similarly, Environmental Science.org (2022) affirmed that the term sustainability, is the attempt to bridge the present-day bionetworks with the upcoming technologies by looking at protecting our natural environment, the human and ecology health while pushing innovation without the swapping of our cultural way of life through renewable fuel bases, reducing carbon releases, defending the environment and keeping the ecology of our planet in a stable state. In this sense, sustainability is about how natural structure function, stay varied and producing whole lot of needs for the bionetwork to be sustainable without harm.

The Green building movement (GBM) therefore, is a comprehensive, continuous and long term common developmental scheme that creates the best possible buildings that protect the planet earth, and green library building is part of this innovative trend. Today, we talk about Green Library Building or Sustainable Library. It is an outcome of the evolution of Green Building Movement which began in the early 1990s. Although green library practice is a new concept across the world, authors like Meher & Parabhoi (2017) affirmed that it is gaining wider acceptance among library and information science professionals every day. Correspondingly, Singh & Mishra (2019) likewise asserted that the need for greener services in the library environment is growing essentially day by day. It is in this connection that this paper used analytical and descriptive methods to closely look at the concept of green library, the structural components of the green library building, the benefits of the new library framework and the sustainability processes for Nigerian green library development.

The Concept of Green Library

The idea of green library is to increase the efficiency of

library building and the information resources using natural energies: the sun, air, water, flowering plants, plastic waste materials, printing, ink, papers, pins, etc. to reduce negative impact of global warming and climatic changes on our ecosystem and exploiting the interior quality of the library building, the information resources and the human wellbeing. Kalpana & Gopalakrishnan (2016) citing Antonelli (2011) affirmed that green library buildings are constructed with recycled provisions that guarantees path of sunlight, water collection, energy saving means with automated systems that reduce energy use, provide temperature control system with green roof top and indoor air quality by indoor plants, wall paint, etc. These sustainability elements are crucial to leverage the overall aims of GBC for safer and robust greener planet.

Similarly, Meher & Parabhoi (2017) observed that green library is all about use of sophisticated building materials and biodegradable technology for climate control in the library setting. The aims are to enhance and sustain the traditional library building structure, the indoor quality and resources. Correspondingly, Malode (2014), Kulkarni (2018) and Sawant & Sawant (2018) in their respective work, have also acknowledged the involvement of a systematic selection of appropriate site and use of biodegradable conservative resources such as plastic waste, water, air, sun, plants, etc. and recycling them into constructive building materials for improved library buildings. On another note, Kulkarni (2018) observed that a green library building is designed, built, renovated, operated or reused in an ecological and resource based efficient manner so that it promotes sustainability. Singh & Mishra (2019) agreed that sustainability, is an international issue that is increasingly used for its significant values for new form of development and innovations. In this regards, green library buildings are sustainable built ecofriendly libraries that are very disquiet about salvaging the earth environment and the human health from the dangers of earth depletion, impact of technology, industrialization, pollution and other harmful human advanced activities within and beyond our planet.

Structural Components of Green Library

Malode (2014) categorized green library building into five basic structures that are designed along suitable setting, water conservation, energy efficiency, biodegradable materials and indoor air quality with additional benefits of innovations and the design structures. Likewise, Kulkarni (2018) identified similar features of a green library to include suitable location, use of recycled materials, insulating glass windows, use of energy efficient lighting system, conservative water, energy and paper, suitable plantations within and outside the buildings, fresh and healthy natural air and environment friendly technologies.

Choudhury & Bhattacharjee (2022) also believed that sustainability is increasingly being achievable through Leadership in Energy and Environment Design (LEED) rating system which is based on capacity structure that recognizes minimal waste at every stage of the building construction work. Green building components in line with LEED rating, stresses the impact of site, building materials, light, air, electricity and water in the building environment. These elements, including others, in green library buildings are highlighted as follow:

- **Site:** the library building should be located in an ecological friendly environment that is free from noise pollution, erosion, insecurity but should have good access roads for users with other available services related structures in the library environment or location, etc.
- **Building materials:** the library building should involve selecting and using recycled waste and other construction materials as much as possible without causing damage to the natural environment. These include the use of Bamboo, straws, precast concrete slabs, clay bricks, cork, straw bales, recycled plastics, reclaimed wood, recycled steel, sheep's wool, rammed earth, marine fossils, hemp-Crete, timber-Crete, solar panels, sawdust, etc. as recognized by LEED. Tarihi (2017) advanced that as natural resources are limited, it is also expedient that the resources should be recycled.
- **Light:** the building should have provision for adequate windows for daylight and low energy light bulbs possibly use of solar and wind produced power rather than use of electricity generated light that emits heat in the library setting, etc.
- **Air:** there should be adequate windows well positioned to allow free flow of fresh, breathable and clean air to cool human and the material resources instead of air conditioners and the ceiling fans that may also emit heat. There should be provision of beautiful flowers and plants providing fragrant and oxygen in and around the library building, etc.
- **Electricity:** this involves use of energy saving bulbs; preferably the use of solar or wind generating power systems that does not emit heat or gas and possibly conserve the surplus energy from the systems for later need, etc.
- **Water:** As natural resources decrease due to draughts, wastes and pollution of water, it is necessary to save natural water in the library for flushing toilets, cleaning and drinking. This is achievable through provision of artisan wells, water tanks and rain water polls, etc.

All these features have been considered as critical part, of the value processes to regaining the natural resources from depletion.

Benefits of Green Library

There are many benefits derivable from the green library. Certified green library building improves efficiency, lower carbon emissions, and create a healthier library place for people to read and do serious research. These are very important part of handling climate change and to meeting the ecological community and corporate control system, refining flexibility of human activities and strengthening the equitable societal effects on the environment. This derivability is capable of decreasing the pressure on the natural resources, human health and the inherent dangers of earth depletion and total degradation.

By adhering to prerequisites and credits that address carbon emissions, energy use, water, air, plants, human health and indoor environmental quality, a green library can be rated by any of such LEED certifications like the Platinum, Gold, Silver or certified leadership which are globally recognized symbols of sustainability achievements. Such achievement certifications of LEED are capable of promoting the image of a library as a standard institution with proficiently guaranteed safer environment with the right things for the library users.

As a holistic building environmental structure, green library does not just focus on one component of a building such as air, plant, water or health, but rather, looks at the big picture factoring in all of the critical components that work together to create the best structure possible. The goals of green library, it must be reiterated, include creating increased protection for individual health, safeguarding and restoring natural water, protecting and enhancing biodiversity and ecological system facilities, stimulating sustainable and reformative material cycles, boost community quality of life, among others.

Yasin & Alpaslan (2020) acknowledged that the green library building has the impression of natural life. This means users can freely relax in the serenity of the library site to cool themselves, increase their level of concentration while reading, spend more time doing research or do other things. In addition, with the plants environment, natural air, beautiful sun light and security, the library environment would in nature be 'home-away-from-home'. Moreover, with its sustainable cutting edge low technology design, the library could provide adaptive users 'resources for research with enhance transferred knowledge for more sustainable ecofriendly achievements.

Choudhury & Bhattacharjee (2022) emphasized that green library built is an eco-friendly environment that is in well-thought-out exceptional institution for impacting environmental education by creating awareness amongst users. Along with this, is providing preserved knowledge by educating the library patrons with their needed awareness regarding the biophysical environment and the ways to conserve its resources of both human and materials form. This is to strengthen and facilitate the

preservation and conservation of used resources whether in print or in digital format in the library, etc.

Processes of Green Libraries in Nigeria

In Nigeria, library development is generally not a priority given the area especially in the development of public libraries. The present high cost of building new structures and maintaining existing ones is something very discouraging and frustrating. However, with the cheap and easy to establish green library structures now trending across the globe, designing, constructing and maintaining libraries in Nigeria would now be inexpensive to build, renovate and maintain without any discouragement and frustration. The structural components of building green structures, such as Bamboo, precast concrete slabs, straw bales, recycled plastics, reclaimed wood, recycled steel, timber-Crete, solar panels, sawdust, board, light-wood, etc. for example, are economical to gather around the Nigerian environment.

With the availability and inexpensive green library building materials, many green library structures could modestly be constructed everywhere in the country by the government, corporate organizations or even by private individuals. Also, the traditional library buildings, many of which are long overdue for renovation and maintenance, could now be converted into green library structures with no real operational damage to the original building framework, the resources and the natural environment.

Correspondingly, adequate windows can be possibly be added to the old library structures for sufficient natural lighting, free flow of fresh, breathable and clean air. With adequate natural light, the library would not need electricity powered grid to operate. The users would come to prefer reading in the natural library situation instead of staying to read under the artificial air conditioners or ceiling fans that are injurious to human health. Again, with the fresh air, beautiful sunlight and the low energy light bulbs from solar/wind generated power system, the library information resources would become free from artificial light and heat coloration from the electricity generated grid. This would save the library scarce financial resources for paying electricity bills and be able to maintain the building structures including providing other essentials for the green library services.

With this new developmental agenda, government can concretize the green library components, because of its economy, as a priority structures for effective and sustainable improved system for educational development agenda. Additionally, individuals and corporate organizations could come to be more involved in green library programs as part of their corporate social responsibility for schools and communities. Through this innovative development, the library environment would come to be more naturally attractive and epicenter of

research activities. This would help in motivating the users and the librarians to come into advance research and collaborative activities in the library. By this, the green library could translate into centers of educating users about earth depletion and the need for implementing the UN earth summits' sustainability goals on global warming, climatic changes and for pushing other needs to claim the planet from total depletion.

As Lugaria (2021) advanced, green building technology emphasizes building with zero energy effects from the design of the building to its construction, from operation to its maintenance and then from renovation to the demolition of the building structure. The key notion here is energy effectiveness, materials proficiency, water efficiency, functional and maintenance optimization including waste and toxic decrease. The green building structure is designed to produce its own power supply through renewable power that eradicates the necessity for normal electricity grid. Lugaria (2021) asserted that zero-energy building use zero disposable net energy with no carbon emissions as it depends on renewable energy produced from wind or the solar system. Such energy can also be saved to power smart appliances such as computers, Smart Network refrigerators, air conditioners, ceiling fans, cleaning and other machines in the library.

On another note, Fenlon (2022) identified other technologies for green building structures such as cool roofs, green Insulation, biodegradable, storm water management, rammed earth, etc. that are designed to improve the interior temperature of the library building by offering increased solar reflectance and reduced warm air remittance either by reflecting intense heat or trapping the interior air, etc. Nigeria as a temperate country would benefit a lot from such structural designs and components when adopted in our libraries. The essence is to make the library interior comfortable for the users' health and also preserving the information resources.

The National Library of Nigeria (NLN), Librarians Registration Council of Nigeria (LRCN), The Nigerian Library Associations (NLA) and other stakeholders in library and information resources matters, etc. can begin the campaign vanguard to enlightening their members and the general populace through planned conferences, workshops, seminars, library week, visitations, etc. about green libraries and the benefits over the traditional library system. This would help in making librarianship and its services well recognized and regarded in the society. Through this, more and more people would come to appreciate librarianship as an inevitable profession that cannot be ignored in the scheme of things for Nigerian national development.

CONCLUSION

It has been established that green library is the efficacy of use of sophisticated building materials and biodegradable

technology to improving the indoor quality and resources of the library and its services. Also established is the increasing use of natural energies as a means of exploiting and improving the interior quality of the library building and information resources; how green library improves human health as a contribution to reducing the harmful impact of global warming and climatic changes on earth depletion. Also established is the concept of green library building as a sustainable tool for improving the traditional library building including the structural components of the building and the resources; the benefits of green library in addressing environmental issues using natural energies as well as the processes for green library development in Nigeria.

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