
GREEN BUILDING –A LITERATURE REVIEW

G. Pavan¹, G.Vamsi², J.Hyndhavi Naidu³, K.Vamsi Krishna⁴, Y.Navya Sri⁵

Under-Graduate Students

Department of Civil

Nadimpalli Satyanarayana Raju Institute of Technology, Sontyam,

Visakhapatnam, A.P-531173.

Abstract:

Green homes represent a huge shift towards sustainability inside the construction industry, aiming to lessen environmental influences whilst enhancing energy performance, fabric sustainability, and water conservation. advanced technology, inclusive of power simulation equipment and artificial intelligence (AI), play a pivotal role in the development of internet-0 power buildings. The use of recycled substances and bio-primarily based alternatives, combined with lifestyles cycle assessment (LCA), helps reduce waste and carbon emissions. Powerful water control practices, consisting of rainwater harvesting and greywater recycling, are fundamental to green building designs. improving indoor environmental quality (IEQ) by means of improving air flow and herbal lights promotes occupant properly-being and productiveness. Certification structures like LEED and BREEAM encourage sustainable practices, even though there's room for greater adoption and development. To deal with demanding situations along with fee and technical obstacles, a collaborative method related to technology, policy innovation, and interdisciplinary research is crucial. This review affords insights into modern improvements and pathways closer to sustainable creation practices.

Index phrases:

Inexperienced constructing, energy efficiency, net-zero strength layout, Sustainable substances, lifestyles Cycle evaluation (LCA), Indoor Environmental satisfactory (IEQ), Water Conservation strategies, synthetic Intelligence, Prefabrication strategies, LEED, BREEAM, Renewable strength.

Introduction:

The construction sector has a significant environmental impact, contributing to resource depletion, high energy consumption, and increased carbon emissions. Green buildings have emerged as a transformative approach to address these challenges by incorporating sustainable practices into construction processes. These structures prioritize reducing environmental harm through innovative solutions such as energy-efficient systems, water-saving techniques like rainwater harvesting, and the use of sustainable materials, including recycled and bio-based alternatives.

Advancements in technology, such as artificial intelligence (AI) and energy performance simulations, have enabled the design of net-zero energy buildings, which rely on renewable resources to meet their energy needs. Additionally, certification frameworks like LEED and BREEAM provide guidelines to promote sustainable practices across the construction industry.

This review examines the advancements, benefits, and challenges associated with green buildings, exploring how they contribute to a more sustainable and environmentally friendly construction sector while addressing pressing global ecological concerns.

Literature Review :

1.Eco-Friendly Construction Materials

Pacheco-Torgal (2014) highlighted the importance of the use of sustainable substances in creation, such as recycled aggregates, bio-primarily based substances, and inexperienced concrete. these materials lessen waste, decrease carbon emissions, and decorate sustainability. Examples like hempcrete and mycelium are especially effective in offering both environmental and functional blessings. Collaboration among policymakers and industry professionals is important to enhancing the accessibility and affordability of these substances.

2. Assessing Environmental impact through LCA

Cabeza et al. (2014) explored the software of LCA and lifestyles Cycle electricity analysis (LCEA) to measure the environmental and energy affects of materials throughout their entire lifecycle, from manufacturing to disposal. those strategies assist pick out the most sustainable constructing substances, allowing the development area to reduce energy use and carbon footprints even as aligning with international sustainability dreams.

3. Energy Simulations For Sustainable Layout

Crawley et al. (2010) mentioned how strength simulation tools can optimize building designs to meet internet-zero strength desires. these gear manual architects and engineers in deciding on green building orientations, insulation structures, and HVAC configurations while integrating renewable power answers like sun and geothermal electricity. the usage of these simulations early inside the design procedure enables make certain maximum energy efficiency.

4. Synthetic Intelligence In Production

Zhou et al. (2022) emphasised the transformative ability of AI in green building management. AI technologies can analyze actual-time information to optimize power consumption, expect preservation desires, and streamline constructing operations. through integrating AI with different structures, consisting of HVAC and renewable electricity sources, buildings can obtain extra efficiency, lower prices, and stepped forward sustainability.

5 Sustainable mission management and Prefabrication

Hwang and Tan (2012) targeted on addressing demanding situations in green undertaking control, which includes excessive charges and confined skilled labor. Their have a look at advocated collaboration among stakeholders and government support to incentivize sustainable practices. Jaillon and Poon (2009) highlighted prefabrication strategies as a means of lowering fabric waste, improving production performance, and improving strength performance. Modular construction and off-website online meeting make contributions drastically to accomplishing sustainability dreams.

References:

1. Pacheco-Torgal, F. (2014). "Eco-efficient construction and building materials." Woodhead Publishing Series in Civil and Structural Engineering.
2. Cabeza, L. F., et al. (2014). "Life cycle assessment (LCA) and life cycle energy analysis (LCEA) of buildings and the building sector: A review." *Renewable and Sustainable Energy Reviews*, 29, 394-416.
3. Crawley, D. B., et al. (2010). "Energy performance simulation for green buildings." *Journal of Building Performance Simulation*, 3(4), 247-262.
4. Zhou, Y., et al. (2022). "The role of artificial intelligence in green building design and management." *Automation in Construction*, 135, 104095.
5. Hwang, B. G., & Tan, J. S. (2012). "Sustainable project management for green building construction." *Journal of Cleaner Production*, 39, 46-53.