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Implementing Green Building Standards For Environmental Conservation-A Review Paper

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Abstract
At present, it's understandable how global warming, the greenhouse effect, and the increasing population are causing negative effects on the environment. India has the largest population in the world with more than 1.43 billion people (2023 census of India) contributing to adverse the environment in many direct and indirect ways. The construction/Infra sector lacks Green Building methods. Major challenges of green building implementation are lack of awareness, unavailability of required construction materials, skilled labour, and expensive low-carbon construction.
Green buildings combine traditional local architecture with modern sustainable ideas. Integrating energy-efficient designs, eco-friendly technologies, and environmentally friendly materials during construction. This approach fosters healthier living spaces while addressing global climate challenges, promoting a harmonious coexistence between human structures and the natural environment. It also reduces excess heat radiations inside and outside of the structure.
Green building is indeed an impactful technology/methodology to keep the constructions beneficial to nature. Combining it with various techniques like rainwater harvesting, renewable energy consumption, etc makes it the best of its kind. It gives a chance for humans to become a real friend of nature, not a foe.
This review paper discusses the challenges, benefits, and advancements of green building and its environmental impact.

Keywords: *Green Building, Environment, Construction Industry, Global Warming, Sustainable Development.*

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I. Introduction

In these rapidly infrastructure developing countries the construction of Buildings and skyscrapers has helped the country boost its economy, especially in the IT sector which has resulted in buildings becoming a massive consumer of energy. To reduce the consumption of environmental resources and energy countries like the USA have adopted an alternative solution of Green Buildings which has aroused widespread attention Globally. Green Buildings are eco-friendly buildings, sustainable buildings that are designed to reduce energy consumption and reduce the negative effects on human health by reducing garbage, and efficiently using natural resources. Green buildings have been widely recognized by the government internationally as a strategy to improve the sustainability of the construction Industry. This report takes a closer look at the ups and downs of green building – the challenges we face, the good things it brings, and the cool new stuff happening in this area.

Green building seeks harmony between the built environment and the natural world, emphasizing practices that conserve resources, reduce environmental harm, and foster healthier living spaces. Green Buildings come with great benefits for the environment and natural resources. One of the foremost advantages of green building lies in its economic benefits. By integrating energy-efficient technologies, these structures can significantly lower operational costs, saving both individual homeowners and businesses substantial amounts in the long run. It uses low-embodied energy materials like fly ash bricks, and silica fume which helps in reducing the impact of global warming It mitigates harmful emissions and waste generation by embracing renewable energy sources like solar energy and using energy-efficient equipment such as LED lights, energy star approved air conditioners, Refrigerators. Green buildings contribute to a healthier and more comfortable living environment, promoting improved indoor air quality and overall well-being for occupants.

Green building, characterized by resource efficiency and reduced environmental impact, encounters its fair share of challenges. From the high initial costs of implementing green technologies to the intricate process of obtaining certifications, stakeholders often find themselves navigating a complex terrain. Additionally, the integration of renewable energy sources and the selection of environmentally friendly materials pose unique hurdles that demand innovative solutions. Despite these challenges, the environmental impact of green building practices cannot be overstated. These sustainable structures significantly contribute to the reduction of carbon

emissions, energy consumption, and waste generation. Through the incorporation of energy-efficient technologies and the promotion of biodiversity, green buildings exemplify a harmonious coexistence between human habitation and the natural environment.

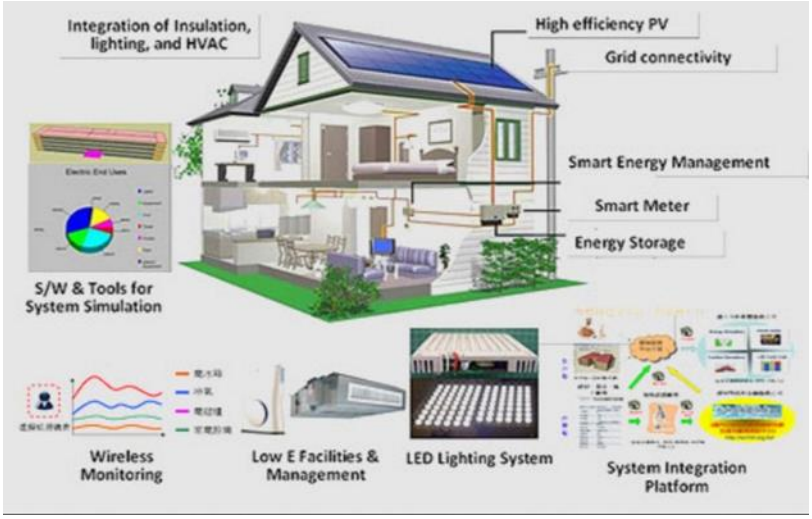

Figure 1 : Layout Structure Of Green Building Technology

Figure 2 : Objectives Of Green Building Technologies

II. Research Background

1)India's rapid urbanization has caused the formation of a slew of major environmental problems hamming the building industry. The increase in the consumption of raw materials, energy, and resources is followed by the increase in the demand for housing and also increasing the carbon content in the air which is extremely hazardous not only when it comes to humans but even it is the main reason for depletion of the ozone layer making it a pathway for greater and worst situations in the future. Several environmental problems are being faced which are making it a necessity for the use of green resources to avoid any future consequences. Places like Nagpur are already seeing the end of it by receiving insufficient monsoons, hotter summers, and shorter winters. To keep in check, we'll bring the Sustainable future of the country or a state the developers must come up with a more sustainable way of building designs. So, the factors which are to be taken into account are cost-effectiveness, durability and the drawbacks of the material which is to replace in place of the traditional materials. On further classification, the factors that are to be kept in check are effective use of land, efficient use of energy, efficient water use, quality of indoor environment, and efficiency of the material. (Laxmi Gupta and all)

2)Development of our country's construction industry by using green materials increasing the opportunity for further development. The developing demand for the living environment in China has emphasized the development of green buildings. This research paper consists of some of the types of GBM (green building material) used in the construction industries of China and the properties of the material from advantageous to

disadvantageous. Here the priorities, the obstacles faced, and how to overcome the obstacles are mentioned. (Hui Zhao and all)

3)Building green buildings must start by taking into account the advantageous properties of the green material being used over the traditional materials or the materials that are not eco-friendly and thus, are damaging the environment directly or indirectly, which also greatly hammers the decline in the environmental conditions' future. Functional, technical, and financial requirements are usually taken into account when it comes to selecting a good sustainable material in the construction industry. The key factor when it comes to green materials that they can be either be recycled or reused. Usually, it has been seen that financial requirements have acted as a great barrier in terms of further discouraging people from putting green or eco-friendly materials into use. Highlighting how green buildings can greatly contribute towards the lessening of the decline in the environmental conditions and problems faced in modern times. By definition sustainable material is one that is domestically created and decreases the emissions of CO2 It may be reused, thermally effective, and use less amount of energy when compared to conventional materials which also increases the opportunities for community members. More importantly, what has more significance when it comes to sustainable and a healthier environment that ensures future security for upcoming generations? (Hassan Tukur and all)

4)Due to various advantages sustainable construction industries are a priority. Huge amounts of urbanization have made it mandatory to implement the use of green materials in construction as well as the use of better methods of construction to further facilitate the environmental conditions. Construction of buildings using sustainable materials will greatly help reduce pollution and also improve existing environmental situations. The use of recycled design products in the construction industry is discussed in this paper. Locally available materials that are affordable and sustainable are mostly in high demand. The purpose of the research paper is to shed some light on the contribution made by the construction industries using green materials. Identification of sustainable materials and replacement of conventional materials with these is a big step toward a greater change that is to see. The increment in total construction expenses while using green materials is by 12-15% and after the compensation of LED installation ended up saving ₹10,000 per year. (Anant Patel as all)

5) This section covers some of the research done with the green products as well as on green buildings. An infrastructure profound for decarbonisation alternatives must be built, new ideas and advancement in green buildings and the introduction economic and financial benefits to consumers should be a key motivation. In the 2020s, improvements in energy and resource efficiency will play an important role in decreasing industrial emissions, paving the way for broad emissions reductions both industrial and automobile. Green products are useful for several reasons: from the consumer perspective, a product that is environmentally preferable relative to comparable products is a green product, similarly for building design a green building is environmentally preferable relative to comparable conventional buildings. Perception of studied in the field of marketing which eventually established a sub discipline known as green marketing. (Firdous Ahmad malik as all)

6) Green building incorporate measure that are environmentally friendly abd resources- efficient across the building life cycle. Green building, sometimes referred to as green building or sustainable building, aids in creating homes that are healthy for both people and the environment green buildings are products that can be sold and have their marketable characteristics. Stakeholders should invest more in green buildings that would ultimately contribute to strong growth in the business of Green Buildings (Abuamer, E. & Bool ak, M. (2015). Businesses engaged in the construction of green buildings how concentrate on factors such as physical characteristics, location, and position, perceived newness, perceived price, perceived value, surrounding area, safety, the calibre of the managers' customer service, green awareness, architectural factors, environmental attitude, social influence, etc. This research aims to explore the research studies available on green buildings. The paper covers the research undertaken from the user perspective. This research study offers valuable directions to the businesses engaged in the construction of green buildings such as physical characteristics, location, and position, perceived newness, perceived price, perceived value, surrounding area, safety, the calibre of the managers' customer service, green awareness, architectural factors, environmental attitude, social influence, etc (Shahid Amin and all)

7) The Infrastructure Industry in India is experiencing rapid growth, with 46% of the total allocation for infrastructure in the 2010 budget. Current buildings contribute 45% of global energy use, contributing to greenhouse gas emissions and global warming. Green building principles can reduce demand for natural and finite resources, such as energy, water, and building materials, and enhance environmental quality by incorporating green building principles into design, construction, and renovation. Green buildings maximize lifecycle performance, conserve resources, and enhance occupant comfort by using technology like fuel cells and solar-heated water tanks. The infrastructure industry faces challenges in financing, including the lack of innovation, the high-cost structure for each project, and the lack of advanced technology and the latest equipment. The government plans to invest in Rupee-dominated long-term bonds to yield more return on investment. Buildings today account for 45% of the world's power consumption, which increases emissions of greenhouse gases and causes global warming. By implementing green building principles into design, development, and refurbishment

projects, it is possible to mitigate the demand for conventional energy sources, such as energy, water, and building materials, and improve environmental quality. Green buildings use technologies such as fuel cells and solar-heated water tanks to maximize lifecycle performance, conserve, and recycle resources, and improve occupant comfort.

India's economy is the fastest growing in the world in terms of trade, imports, and exports, but a stumbling block to business development is the country's poorly developed infrastructure. Forty percent of mostly by whole budget is allocated Indian government.

III. Methodology

Research, study, and development in the line of green buildings towards a sustainable and brighter future with a huge step against air pollution and global temperature rise is the main aim of this study. This study also aims to encourage people by spreading awareness amongst people on how it saves the environment as well as is cost-effective and helps with great savings. This isn't just an issue that is to be seen by a country or two, but it is a major global problem that is to be brought into consideration by all. By writing this study we hope to see the world even greener. A sustainable future is what we strive for, and a sustainable future is what we will get.

Buildings And The Natural Environment

While the relationship between buildings and the natural environment is complex, aspects have been captured in a number of frameworks and equations. Erlich, for instance, shows how environmental impacts are linked to technology, the size of human populations and the levels of consumption and waste in society (Ehrlich and Ehrlich, 1991). This relationship is shown in the equation below.

I = PCT

Where:

I represents environmental impact

T represents technology, the built environment and infrastructure

P represents the size of the human population

C represents levels of consumption and waste of the human population

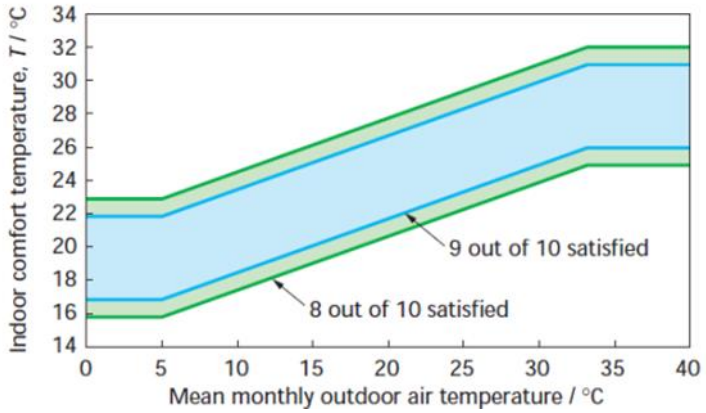

Figure 3 : Adaptive Comfort model(American Society of Heating, Refrigerating and Air-Conditioning Engineers)

IV. Conclusion

- Green building practices offer a sustainable solution to contemporary construction challenges. Through energy efficiency, eco-friendly materials, and a focus on occupant well-being, these structures reduce environmental impact, lower operational costs, and promote a healthier society. Embracing green buildings is essential for a resilient, cost-effective, and environmentally responsible future.
- Green building design aims to minimize resources and maximize reuse, Recycling, and utilization of renewable natural resources. It maximizes the use of efficient building materials and construction practices, optimizes the use of onsite resources and use of renewable sources of energy, uses efficient waste management practices, and provides comfortable and hygienic indoor working conditions. Green buildings have a low impact on the natural environment, reduce energy and water usage, protect occupant health, and increase productivity, designed in a manner that minimizes waste population environmental degradation.
- Green building techniques are methods and systems used in constructed environments to reduce their negative effects on the environment while maintaining the structural integrity of buildings and making them comfortable and productive places to live and work.

- Buildings account for over 40% of the world's energy consumption and over 33% of greenhouse gas emissions, therefore it's critical to make sure they become more energy-efficient and lessen their impact on global warming.

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