

Green Building Concept Analysis Using Different Framework

Sunil Meena, Naveen Kumar Meena, Satish Meena, Kuldeep Singh Kulhar

Abstract- The construction business is one of the huge energy customers and makers of Green House Gasses (GHG). It eats up 38% of the overall energy; and this bar the usage of various resources like water. Universally, this has extended the crisis of an unnatural climate change and has incited improvement of green designs. In the Sub Saharan Africa alone, 56% of energy used is by building assignments. Green constructions are publicized as traditionalist, resource capable and innocuous to the environment appeared differently in relation to the convectional structures. This assessment explored the level of determination of green construction thoughts in business structures and the key challenges arising out of their gathering resolved to choose legitimate procedures for executing them. The assessment was driven through an investigation strategy and used surveys, interviews, discernments for data collection. It furthermore evaluated detailed data from available records including journals and books. The assessment revealed that enormous level of the design advancement players and specialists drew in with the actually reviewed fabricated business structures in our country thought about the green construction thoughts yet minimal level of the thoughts had been participated in the constructions. In this paper an examination is coordinated which choose the principal thoughts remember for the advancement of green constructions also the strategies are moreover discussed which can help with making care in people concerning the upsides of green design and could be a phase towards green construction practice for the future world.

Index Terms- Green Building; Energy; Environment; Green House Gasses; Green Construction.

I. INTRODUCTION

The design business's reasonability ethics relies upon the norms of resource adequacy, prosperity and productivity and understanding these principles incorporates an organized philosophy wherein a construction assignment and its parts are seen on a full cycle premise.,

Dr. Kuldeep Singh Kulhar, Assistant Professor, Department of Civil Engineering, Vivekananda Institute of Technology, Jaipur, Rajasthan India.
Sunil Meena, Student, Vivekananda Institute of Technology, Jaipur, Rajasthan India
Naveen Kumar Meena, Vivekananda Institute of Technology, Jaipur, Rajasthan, India
Satish Meena, Student, Vivekananda Institute of Technology, Jaipur, Rajasthan, India

This "backing to help" approach known as 'green' or 'plausible' building, considers a construction's hard and fast monetary and environmental impact and execution from material extraction and thing collecting to thing transportation, building plan and advancement, movement and upkeep and building re use and evacuation. Green designs use less energy, water and normal resources stood out from the convectional structures.

They also make less waste and give better living environment, further they intertwine features like useful usage of water, energy powerful and eco-obliging environment. The designs use harmless to the ecosystem power and reused materials, embrace feasible usage of scene and have improved indoor quality for prosperity and comfort. In the United States more than 30 states and common ventures advance some level of energy viability and natural commitment with respect to the private turn of events. The green constructions have been displayed as traditionalist and as alternatives to convectional structures, and the hard and fast number of business green design charged has hit the 10,000th engraving. In Canada more than 212 green designs had been approved since 2010 while in India the green thought has thrived with two green rating systems specifically Leadership in Energy and Environmental Design green rating structure (LEED) and Green Rating for Integrated Habitat Assessment (GRIHA) successfully being utilized. In the causing situation like Africa, viable improvement has not gotten sufficient thought despite being a huge piece of sensible development (Adebayo, 2000). As shown by the World Bank Development report of 2009, simply South Africa has a set up Green Building Council (GBC) yet this is step by step changing with Morocco, Mauritius and Egypt being at present setting up their panels.

II. OBJECTIVE

Green Buildings are designed to reduce the overall impact on human health and the natural environment by the following ways using energy, water and other resources efficiently, by reducing waste, pollution, and environmental degradation.

A. Green Building Features

Eco-Friendly by least unsettling influence to eco frame work. Energy productive through the regular lighting ventilation and sun oriented detached plans proficient utilization of water-through reusing and water gathering utilization of sustainable power through photograph voltaic frameworks and close planetary system etc. On harmful material in entryway climate, utilization of reuse/recyclable materials, proficient waste usage and removal.

Why is Necessity to Make the Building Green?

1. Global-energy-use
2. Construction Industry Contributes to Nearly 50% of Energy Consumption

III. GREEN BUILDINGS

Green design in any case called green advancement suggests a development using an association that is earth proficient and resource viable all through a construction's life-cycle from sitting to design, improvement, movement, support, rebuild, and obliteration. This requires close joint effort of the entire assignment accomplices all endeavor stages. The Green Building practice develops and supplements the old-style building arrangement stresses of economy, utility, strength, and comfort. Though new advancements are constantly being made to enhance force practices in making greener developments, the customary objective is that green constructions are proposed to diminish the overall impact of the manufactured environment on human prosperity and the regular living space by capably using energy, water and various resources, guaranteeing occupants' prosperity and improving laborer proficiency and decreasing waste, tainting and normal defilement.

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Green constructions join measures to diminish energy use. To diminish working energy use, originators use nuances that lessen air spillage through the construction envelope. They in like manner demonstrate unrivalled windows and extra security in dividers, rooftops, and floors. Makers orchestrate windows and dividers and spot overhangs, yards, to cover windows and roofs. In like manner, convincing window game plan can give more standard light and lessen the necessity for electric lighting during the day. Sun situated water warming further declines energy costs. Constructions address about 70% of the force load, 40% of all energy usage, and 40% of CO₂ releases. Subsequently, making structures more energy capable can be one of the speediest and, with rising energy costs, most monetarily insightful ways to deal with reduce ozone hurting substance surges. In the United States more than 30 states advance some level of energy adequacy in private improvement alone. This conflict is also focused by National Science and Technology Council that by accepting legitimacy thoughts there is decline in energy, action and upkeep cost, reduced design related infections and diminished waste and pollution.

A. Energy Efficiency

Building warming and cooling are the most energy-heightened works out, followed by power use for lighting and machines. Ozone exhausting substance radiations from structures energy use out and out outperform those from transportation. The extending interest for private and business building spaces in rural countries will furthermore push up energy usage from building. As shown by US Environmental Protection Agency, most constructions can show up at energy viability levels past the necessities in the green standards when reserved arrangement systems like design shape and bearing, idle sun situated arrangement and use of ordinary lighting are considered. Worldwide Panel on Climate Change (IPCC) expected that CO₂ releases from structures including utilizing force could augment from 8.6 billion tons in 2004 to 15.6 in 2030 under a high

improvement circumstance. Nonindustrial countries will contribute significant extensions in CO₂ because of high energy use from the design region. IPCC battles that such a design impact offers an opportunity to showcase energy useful progressions to diminish both CO₂ releases and energy use. Improved capability in the design region and de-carbonizing the power region could offer gigantic potential releases decline.

B. Techniques for Reducing Energy use

Studies show that there are a couple of various methods of decreasing energy use in designs and much effort has attempted to apply limitless materials and harmless to the ecosystem power resources in constructions to use energy beneficially. Discussed underneath is the route decline in energy use can be cultivated in structures.

C. Lighting

Lighting addresses 4% of energy use in houses and up to 30% of energy use in business structures. Light control and sharp meters are being raised as extraordinary practice to diminish energy use in structures. They contain an association of sensors that can murder lights when there are no people in the design. Wise meter check screen where and how energy is used in the construction, and as needs be helps with recognizing the response for improve energy efficiency.

Force can in like manner be reduced through improved Light Emitting Diode (LED) or extended usage of ordinary lighting and the use of energy-useful machines. Fused design plan and the change of building shapes, course and materials can moreover diminish energy use. Driven lighting offers better magnificence and distinction, energy save reserves, on numerous occasions as useful as 8 customary bulbs. It will diminish power revenue by 75% at whatever point used. According to an IEA report, lighting addresses 19% of the force to be reckoned witch's use and delivers 1.9Gt of CO₂ yearly [12]. Driven lighting and splendid control are more useful than customary lighting headways. Nevertheless, they are more expensive than standard lights. The market change from standard lighting to LEDs needs financial assistance from government to help the LED market. China is the principal country to set up an immense LED programs, presenting 210,000 LED streetlamps in 21 metropolitan regions in China.

Table 1: How different Bulbs Compare in terms of Power consumption

Minimum Light Strength	Electricity Consumption in Watts		
	Inland ascent	Compact Fluorescent	LED
450	40	9-13	4-9
800	60	13-15	10-15

1100	75	18-25	Not Available
1600	100	23-30	Not Available
2600	150	30-52	Not Available

D. Temperature Control

Most of energy use in building in Europe goes to heating, ventilation and air conditioning (HVAC) cooling, accounting for 55% of energy use in residential buildings and 35% in commercial buildings. The heat generated from computers and other electronic appliances can be recycled to heat the building if the rooms are properly designed. Heat pumps and heat exchangers can transfer heat from IT server rooms to other parts of a building or to heat up offices during cold seasons. This argument by Scott is advanced by green economy that a more holistic approach to the design of buildings and their use also requires consideration of all energy related components including appliances. Siemens has proven with its energy efficiency solutions that every building has already today an energy efficiency improvement potential of 20-30% on average this can be achieved by optimizing the building management system, lighting, heating and cooling system, water and energy distribution and many more areas. In the local context, heating is not common even though cooling is in hotels and a few residential buildings. Despite kerosene, charcoal and gas being commonly used for heating in most homes; commercial buildings prefer the use of electricity for heating and lighting.

E. Passive Design Contributes

Studies such as the U.S Life Cycle Inventory data base project show that buildings built primarily on wood will have a lower embodied energy than those built primarily with brick, concrete or steel. In order to reduce the embodied energy, high efficiency windows and insulation in walls, ceiling and floors increase the efficiency of the building envelop. Use of passive solar building designs are other strategies that designers put in place to achieve energy efficiency. They orient windows, walls and place trees to shade windows and roofs to maximize solar gain. Additionally, correct window placement for day lighting provides more natural light and lessen the need for electric lighting during the day.

According to Rode, passive design strategies can dramatically affect building energy performance. The measures include shape, orientation, passive solar design and use of natural lighting. A study by Lamonica, appears to confirm that passive technologies like solar collectors can heat up buildings' water up to 200 degrees and provide energy savings.

F. Waste and Material benefits of green buildings

Considering efficiency in materials, green buildings address growing scarcity issues that many societies face due to unsustainable use of ecosystem services. To reduce building impact and to fulfil a complete life cycle of building and material construction impact, it is necessary to establish low impact criteria during design, construction, maintenance and disposal.

The criteria to be followed include resource availability, minimal environmental impact, embodied energy efficiency, potential reuse and recyclability. Reducing the number of material components in products as well as separating natural from synthetic material allows higher rates of recyclability and reuse. According to Lawson the above criteria show that, for example, sustainably sourced wood is one of the best options for ensuring low embodied energy and minimal environmental impact. Lawson's study reported that 95 per cent of embodied energy that would otherwise go to waste can be saved by the reuse of building materials. Studies on re cycling indicate that environmental impacts caused by reused materials are at 55 per cent of the impact caused if all materials had been new. Although recycling materials requires energy consumption, studies show that recycling materials still delivers net emissions savings. In developing societies recycled building components are often cheaper and of higher quality than conventional materials.

IV. EVALUATION AND RATING OF GREEN BUILDINGS

To evaluate the manageability of structures and development exercises it is important to have the option to gauge and confirm their presentation. Different rules and rating frameworks have been planned that give a sign of the presentation of structures and development exercises as far as manageability. These frameworks principal destinations are; to help the plan of reasonable structures and to help assess the supportability of structures. The prevalent rating frameworks incorporate Building Research Establishment Environmental Assessment Method (BREEAM) generally utilized in the UK, Leadership in Energy and Environmental Design LEED which was created by the US Green Building Council (USGBC), Green Star created by the Green Building Council of Australia and the Green Rating for Integrated Habitat Assessment GRIHA of India among others. No single estimating plan can give a completely thorough and undisputable appraisal of all manageability parts of a structure.

Early evaluating frameworks like BREEM and LEED started as essential agenda on what to do and not what to do and advanced further to frameworks that granted focuses for specific accomplishments. The center regions attempt to consolidate ecological, social and monetary parts of supportability. The ecological measurement contains standards identified with energy use, water and material use and waste administration; the social measurement ranges from openness of the structure, inhabitants' prosperity and safeguarding of social and social qualities while financial models identify with parts of reasonableness and life cycle costs. LEED rating framework envelops five natural classifications specifically practical locales, water effectiveness energy and climate, materials and assets and indoor ecological quality in addition to development and plan class. It additionally measures angles like energy utilization, squanders age and sustainable power selection and assesses the ecological exhibition of a structure comprehensively over its whole life cycle. The four sub classes of GRIHA are site choice and arranging, building arranging and development, building activity and upkeep and advancement. BREEAM then again is utilized measure the manageability of new non-home grown structures in the

United Kingdom. It has a two-phase evaluation measure including the plan stage and post development. The regions for appraisal incorporate energy, water, materials, waste, wellbeing and prosperity, contamination transport and biodiversity. This examination will endeavor to relate how these information sources have an orientation on the level of reception of the green structure ideas. The figure beneath shows the yield - green structure, being the free factor and the information sources the trustworthy factors.

A. Obstructions to the Adoption of Green Structure Ideas

To decide the difficulties looked by experts in the reception of green structure ideas, respondents were approached to utilize a 5 direct scale toward decide the degree the recognized difficulties in the writing audit frustrate expanded selection. A mean score was determined where a lower mean implied that the factor represented a high test though a higher mean was deciphered as a less test in embracing the idea.

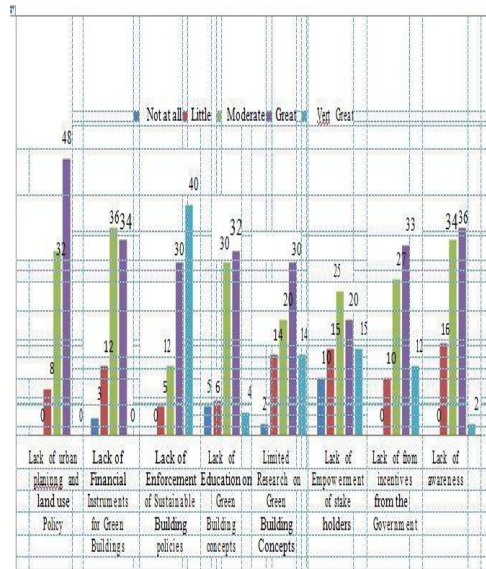


Fig. 2: Responses to challenges in the reception of the green structure Concepts.

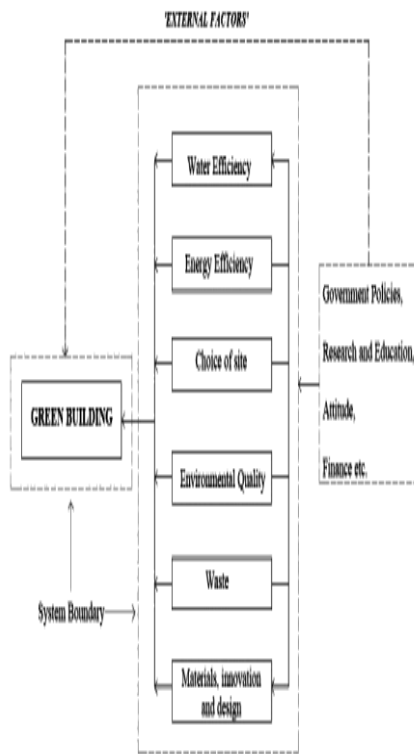


Fig. 1: Conceptual Frame Work

Table 2: Mean score for take-up challenges

S. No.	Uptake Challenges	Mean
1	Lack of enforcement of sustainable building policies	1.81 Lack of incentives from the govt. e.g., Tax holiday
2	Green loans etc	2.43
3	Limited research on GBC	2.50
4	Lack of urban planning and land use policy	2.56
5	Investment in Green Building related research	2.69
6	Lack of financial instruments for green buildings	2.81
7	Lack of empowerment of stake holders	2.82
8	Lack of awareness	3.74

B. Green Building Concepts Strategies

The last even-handed of the investigation was to decide proper techniques for executing green structure ideas in business working in Nairobi. In this target respondents were approached to utilize a 5-guide scale toward decide suitable systems that can be utilized to advance take-up of green structure ideas. A mean score for the methodologies was determined where a lower mean implied that the system advanced take-up though a higher mean was deciphered not to be the quickest method to advance take-up of the ideas. Figure 2 and Table 2 show the reactions and the mean thing score on

the elements that are considered to advance take-up of green structure ideas.

As indicated by my insight and exploration identified with my work wraps me up choice that exacting enforceable metropolitan land and arranging strategy, improved requirement of standing rules by neighborhood's government just as schooling and preparing zeroing in on manageability are a portion of the suitable systems that this examination finished up to be among the methodologies that can be received to advance take-up. Severe authorization of approaches particularly at the purpose of building plans endorsements would drive the business experts to accept green development in their practices. Instruction preparing and research directly from the lower educational systems and to establishments of higher learning would deliver naturally engaged alumni who will effortlessly accept maintainability ideas in their undertakings.

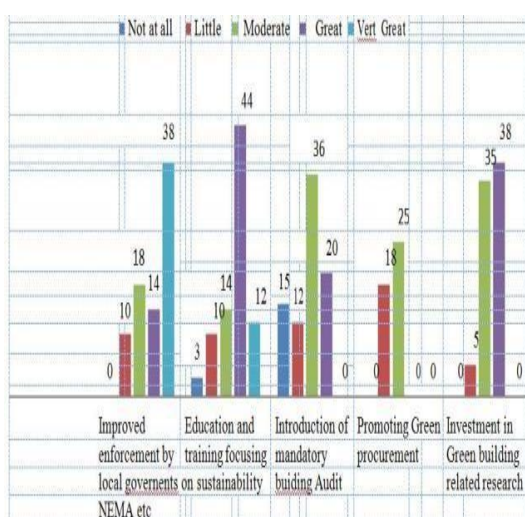
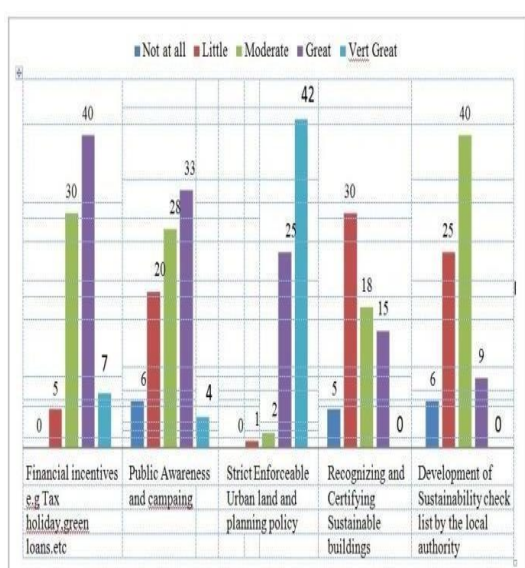


Fig. 3: Factors advancing take-up of green structure idea

a. Different from other Buildings

The plan, keep up and development of structures have colossal impact on our current circumstance and regular assets. Green Building is unique in relation to different structures since it utilizes a base measure of non-renewable energy, produce negligible contamination, expands the solace, wellbeing and security of individuals who work in them. It additionally limits the loss in development by recuperating materials and reusing or reusing them

b. Increasing Green structure in India

Today in excess of 1053 green structures (as on April 2011) are being built all over India. Of which 147 green structures are guaranteed and completely practical

V. ADVANTAGES OF GREEN BUILDING

Structures largely affect the climate, human wellbeing and the economy. The fruitful reception of Green Building created can augment both the monetary and natural execution of the structures.

1. Environmental Benefits: Ensure bio variety and eco frameworks; improve air and water quality, decrease squander streams, save normal assets.
2. Economic Benefits: Lessen working expense, make, extend, and shape markets for green item and administrations, improve tenant usefulness.
3. Social Benefits: Upgrade tenant solace and wellbeing, increase stylish characteristics, limit strain on neighborhood foundation, improve generally speaking quality life.
4. Natural Resources: According to studies directed in 2006, 107.3 million sections of land of complete land region are created, which addresses an increment of 24% land covering green structures in the course of recent years. In terms of energy, structures represented 39.4 percent of all out-energy utilization and 67.9 percent of absolute power utilization. Reduce working costs Create, extend, and shape markets for green item and administrations Improve inhabitant efficiency.

VI. CONCLUSION

This research observed the exciting developments taking place on the technology front and analyses their implications for intelligent and green buildings, highlighting examples of "best in class" buildings employing green and intelligent technologies. These buildings are dynamic environments that respond to their occupants changing needs and lifestyles. This research provided documented evidence to educate and influence end-users, building owners, architects, and contractors that a "greener building" can be achieved using intelligent technology and that this "greening" will provide a tangible and significant return on investment .to all of the above going 'Green' is the only.

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