



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 Issue: V Month of publication: May 2022

DOI: <https://doi.org/10.22214/ijraset.2022.42756>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

Conversion of Conventional Building into Green Building: A Review

Miss. Apeksha. D. Tembhurne¹, Prof. Dilendra Jasutkar², Prof. Hirasdas G. Lilhare³

¹PG Student, (M-Tech in Environmental Engineering), Civil Engineering Department, SWAMINARAYAN SIDDHANTA Institute of Technology, Nagpur, Maharashtra, India

^{2,3}Assistant Professor, Civil Engineering Department, SWAMINARAYAN SIDDHANTA Institute Of Technology, Nagpur, Maharashtra, India

Abstract: Now-a-days due to excessive population growth, people required more number of houses to stay within but they generally build normal building in which energy consumption is more which inefficient, but the energy sources is decreasing very fast now-a-days so by implementing the green building throughout the world, we can reduce conventional energy consumption and so by reducing population Green building is that the one during which use less water optimizes energy efficiency, conserve natural resources and generate less waste and supply healthy spaces for occupants as compare to conventional buildings A study entitle " conversion of conventional building to green building. "Operation, maintenance and end of cycle cost are in the range of 36% to 42%, 25% to 30% and 7% to 18% respectively lower than that of conventional building. Study found that the life cycle cost of green building is 24% to 29% less than conventional building. In this paper an analysis as given to compare and conversion of conventional building to green building.

Keywords: Conventional building, Energy efficiency.

I. INTRODUCTION

Green building was also known as green construction or sustainable building is the practice of creating structure and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle. There is a need for concentrating on green home, which is one of the most discussed topics throughout the world, in the era of global warming and climatic changes. Green buildings are characterized as those providing the required building performance over the building life cycle which minimizes the consumption of non-renewable resources and environmental loading to land, air, and water. Time has changed, and strengthened by the advantages of green building rating tools, the industry now recognizes that green building delivers much more than energy efficiency alone. It also understands that green building must be viewed totally that energy efficiency cannot come with a price of less fresh air and poor indoor environmental quality, or high-water consumption. Building structures must be explained in the form of their impact on local, natural, and built environment and their surroundings. While the green building has much more environmental benefits, we have made this report to focus on the social and economic benefits of green building.

A. Green Building

A green building is one that uses less water, optimizes energy efficiency, conserves natural resources, generates less waste, and providing better space for living, as compared to a standard building. Green building is that the practice of increasing the efficiency with which buildings uses resources like energy, water, and materials while reducing environmental impacts during the building lifecycle. Green building is intended to scale back the general impact of the built environment on human health and therefore the natural environment by:

- Efficiently using energy, water, and other resources.
- Protecting occupant health and improve productivity.
- Reducing waste, pollution and environment degradation.

Effective green building can lead by reducing operating costs by increasing productivity and using less energy and water, improved public and occupant health due to improved indoor air quality, and reduced environmental impact by, for example, less storm water runoff and the heat island effect. In short, a green building should create a joyful environment when entered, tranquility, and health when occupied and regret when departed. The energy-efficient and environmentally conscious building design is essentially a combined approach. Building materials and design methodologies need to be carefully evaluated to minimize energy use to minimize the ecological degradation that may be caused by the construction of the building and provide a cost-effective solution.

1) *Aim of Project:* The aim of the project is to find out a simple and economic way to construct a green building project in terms of energy, water, and material used during the construction phase to provide social, environmental, and healthier benefits to occupants by green building over the conventional building.

2) *Object of Project*

- To compare the cost of construction of green building and conventional building.
- To find out energy and water saving in a green home over the conventional home.
- To find out social and environmental benefits of green building over conventional building.
- To find out middle way to encourage the green construction.

3) *Reason why project is Important*

- It is generally said that green building will cost much more than the conventional building, but some middle way is required to be found out real situation and condition in market.
- In these days when everybody is talking about the green construction there is need of a way by which a common man can afford a green home.
- The manufacturing, design, construction, and operation of the building in which we live and work are responsible for the consumption of many of our natural resources.
- Seeking to lower all environmental impact and maximize social and economic value over a building's lifecycle through design, construction, operation, maintenance, renovation, and demolition.
- Making the invisible visible, personified resources are the invisible resources use in building, for example the energy or water used to produce and transport the materials in the building. Green building considers these amongst a building impact, ensuring that our buildings are truly of low impact.
- Minimizing energy use in all stage of building's lifecycle, making new and renovated building more comfortable, less expensive to run and helping building users learn to be well planned too. Combing renewable and low carbon technologies to supply buildings energy need once design has maximized inbuilt and natural efficiencies.
- Recognizing that our urban environment should preserve nature, ensuring diverse wildlife and land quality are protected or enhanced for example by remediating and building on polluted land or creating green space.
- Looking for ways we can make our urban area more productive, bringing agriculture into our cities.

4) *Scope of Project*

- The typical case selected in the project would be useful while considering cases for the residential sites.
- This project will be identical for the person who are associated with this type of work, to construct a green home rather constructing a conventional building, bearing some extra initial costs which will be paid back in some year after starting the use. This will be beneficial for the people who are really conscious about the environmental impact of building and believe in energy saving.

5) *Introduction of Company*

Pune Prizm Construction Management Private limited

It is classified as Indian Non-Government Company Pune Prizm Construction Management Private Limited. is a non-govt company (from last 12 year's) incorporated on 22 Apr, 2008. It's a private unlisted company and is classified as 'company limited by shares. It is involved in construction consultant that is IT Park projects, Residential projects, Commercial projects and industrial Project. and other technical activities. We are in the field of construction consultant business from last 25 years. We are providing services like Firefighting, plumbing, Electrical, Air conditioning, Estimating, Value engineering, Construction engineering, Material contract building, Regularity Approval, Project Management, Job site meeting, Cost control, Inspection, Schedule analysis, Shop drawing, Labour and material, Job site record and Documents. Our team has provided services on number of projects.

a) *Company's Vision, Mission and Values*

- *Vision:* Our vision is to serve the engineering, architectural and management services to our esteemed clients to its best urges with the inclusion if the bases approach, innovation and creativity.
- *Mission:* Our mission is to make Pune Prizm Construction Management Private a one stop shop for an array of engineering, architectural and management services with worthy contribution to the industry and where everybody is treated with the top most respect and kindness fir their honest, hard and dedicated efforts.

b) Values

- Safety
- Commitment
- Teamwork
- Quality
- Excellence
- Integrity
- Smart-Work

- c) *Company's Projects:* M/s Pune Prizm Construction Management Private Ltd take a contract of all type of structure such as Residential, Commercial, Industrial, Towers, and others. It also excels small projects of Renovation, Repairs and Restoration.



Fig. Ish InfoTech, Hinjewadi, Pune

II. LITERATURE REVIEW

Meeting the need of people today without destroying the resources that will be needed by the person in the future; based on long-range planning and the appreciation of the finite nature of natural resources is what sustainability is. With rising energy costs, tightening budgets, increasing populations, and diminishing resources, most of the people are turning to green buildings.

- 1) M. Khoshbakht & Z. Gou et.al (2016) this study explains the eye to the importance of research methodologies and compare the benefits and drawbacks of every method for calculation of various cost variables in Green Building. Moto of this study is presenting a literature review of cost-benefit prediction methods combined with a SWOT analysis, particularly emphasizing data collection, and logical approach.
- 2) Bon-Gang Hwang & Jac See Tan (2012) summarized aspects like compare design, construction, and commission stages between conventional and green building construction projects supported a comprehensive literature review. This study aims to spot common challenges encountered during management of green construction projects and their impact on project performances, also proposing some solutions to beat the obstacles
- 3) Yusuf Latief & Mehemet Ali Berawi (2017) proposed that the operational and maintenance aspects of Green Building, optimization is done through energy conservation and conservation. Additionally, it had been full of indoor health and convenience/comfort. The aim of optimization during this study improves building performance with some green concept alternatives. The research methodology could be a mixed method of qualitative and quantitative approaches through questionnaire surveys and case studies.
- 4) Ms. Alexia Nalewaik & Ms. Valerie Venters (2014) summarized that Green construction yields variety of advantages to the owner, both tangible and intangible. Sustainably-designed buildings enjoy lifecycle cost savings, improvements in human performance, and a rise in prestige. This paper gives a short descriptive view of green building and rating systems, followed by a discussion about the tangible and intangible benefits of sustainable design and development.

- 5) Arijit Sinha & Rakesh Gupta et.al (2012) summarized how green building relates to sustainable development practices. Sustainability also governs decisions concerning building materials. A whole explanation of what's needed to create a green building. This paper presents how inefficient it can be in future aspects, when included, within the bigger and developing scheme of green building rating systems and introduces an integrated design concept for green buildings.
- 6) Akshay B. Mokal & Allaudin I. Sheikh et.al (2015) has studied features of all construction material that are socially, economically beneficial for the development industry and human health. Green construction material reduces side effects on the environment. to create an efficient sustainable structure further as will lessens the environmental pollution content like gas emission, resource depletion, soil pollution, health hazards, ozone depletion, etc.
- 7) Ramesh S P & Emran Khan M et.al (2013) discusses the role of energy efficiency in green buildings in Indian scenario to cut back the energy consumption and environmental degradation through Green House Gas emission. The chance and benefits of harmonizing governmental and private-sector schemes also are discussed in their technical paper. The consumption of energy by buildings is largely reduce through improving efficiency, which is an efficient means to reduce gas emissions and bog down the depletion of non-renewable energy resources.
- 8) Victor Yepes & Diana Owens by-Conte (2012) suggested that the energy efficiency is that the most interesting topic for the studies because it involves others indirectly or indirectly way green building aspects (design, materials, water-saving, cost).
- 9) Ming Shan & Bon-Gang Hwang et.al (2017) undertakes a scientific review of practices, policies, initiatives, and study efforts within the area of sustainable construction project financing and explore the potential opportunities for future study actions. This paper has presented the research efforts of sustainable construction project financing implemented worldwide.
- 10) Amos Darko & Albert P.C. Chan et.al (2017) identified the foremost drivers for implementing GBTs within the housing industry to encourage the widespread adoption of Green Building Techniques. they're advised up-to-date in mind that while the initial investment is also high, benefits are going to be reaped within the long term, in order that they should wait and see to determine the return on their investments.
- 11) L. Zagreus & D. Lehrerl et.al (2006) summarizes the results of an outsized indoor environmental quality survey in office buildings, comparing green with non-green buildings. occupants in green buildings were more satisfied with thermal comfort and air quality improving ventilation, removing indoor pollutants, using green materials, giving occupants personal control over operable windows, task air-conditioning, or underfoot air distribution systems, employing daylight, and reducing ambient light levels by using task lighting.

III. CONCEPTUAL ASPECT

A. Need of Green Building

The construction industry of India is one of the largest economic activities that contribute to the nation's development. India has been witnessing huge growth in the building and construction sector for the past 5 years. As it is healthy trends it is putting high pressure on the resource demand. Green building practices can eliminate or reduce negative environmental impact and improve the existing unsustainable design, construction, and operation practices.

B. Goals of Green Building

Green building brings together an expansive line-up of practices, techniques, and skills to scale back and ultimately the impact of building on human health and on the environment. It often highlights taking advantage of renewable resources, for example- using sunlight through passive solar, active solar, and photovoltaic equipment, and using plants and trees through green roofs, a rain garden to scale back the rainwater runoff.

Fundamental Principles

- 1) Structure design efficiency
- 2) Energy efficiency
- 3) Water efficiency
- 4) Materials efficiency
- 5) Waste and toxic reduction

C. Impact of Green Building on Economy

If green buildings were to become widespread, they might impact the economy in a substantial way. In fact, due to huge resource savings, such as energy, materials, waste, and labour, green buildings would probably provoke a restructuring of the present Indian economy.

For instance, if the size of energy consumption decreases by 20%, we could assume that the same proportions would also decrease the budget of the Bureau of Energy Efficiency (BEE). This is of course just an assumption based on estimations; however, it would give an idea of the direct savings for the taxpayers.

D. Indian Green Building Council Rating System

IGBC has developed green building rating programs to cover commercial, residential, factory buildings, etc. There are buildings that adopt one or more green features. To recognize the extent of green features that a building adopts, Rating Systems are evolved and are available aged within the US and Europe. These rating systems are playing a pivotal role in the market transformation of the green buildings. Eco or green design principles are universal; it can't be one for the USA, one for India and one for Japan. Most of the green building rating systems touch on an equivalent chord – conservation of resources. But the LEED (Leadership in Energy and Environmental Design) rating system has turned out to be the most versatile and robust. After considering various rating systems, the Indian Green Building Council (IGBC) decided to adopt the LEED scoring system.

IV. CONCLUSION

- A. The launch of 'LEED India' Green Building rating system will facilitate to advance growth of green buildings in India. The Indian Green Building Council would offer the proper impetus for advancing the Green Building movement in India and enable India to be together recognized of the leaders in green buildings
- B. This building is a response to a demand for energy reductions by primarily attributed to improved envelope, lighting power density as well as daylight, sensors in perimeter spaces, along with reduction in cooling loads due to improved glazing specification, passive architectural design, which helps to achieve 40%-60% energy efficiency.
- C. Optimized energy and water resources will not only decrease the use of natural resources but will also help to reduce direct and indirect cost saving for water and electric bills.
- D. The initial cost of Green Building is Sometimes Higher than conventional building, but the savings is created in green building by low consumption of energy, water, and health cost, gives a quick return of investment and makes an effect in revenue.
- E. India and due credit should be given to such projects. Local municipal corporations and housing finance institutions should also be involved in rewarding the green achievements of the builder by giving some sort of incentives by way of reduced property taxes, loans at concessional rates, etc. Manufacturers and suppliers of energy efficient building materials and alternative products, solid waste management and waste water recirculation system suppliers, etc. can also be offered easy and low the percentage increase of construction about 12 to 15% in the total cost is a negligible amount when the intention is just to gain extra return benefits and to live in better and healthier environment interest finance as well as tax concessions or exemptions.



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)