

An Insight Into Green Buildings

The author expounds on how good sustainable design offers economic, environmental and societal benefits. The article discusses the evolution of TERI's green building rating system GRIHA (Green Rating for Integrated Habitat Assessment) and its substantial contribution to measuring the “greenness” of a building in India.





Introduction

The tremendous growth in economic activity across the globe is placing pressure on natural and environmental resources. There is increasing evidence that human activities are causing irreversible damage to the global environment, impact on the quality of life of future generations. The rising concern for the environment is driving thinkers to seek sustainable solutions.

The real estate industry is a significant contributor to global warming due to the extensive emissions of greenhouse gases (GHGs) from the energy use in buildings. In some countries, the built environment accounts for about 40% of the energy used. Therefore, there is an imperative for the industry to develop sustainable building technologies and green buildings.

The real estate industry is one the major energy consumers and GHG emitters. Hence, real estate activity in India has a significant impact on the environment and resources. This indicates that there is a real opportunity to develop green buildings in the country.

However, developers face a major challenge in the development of green buildings as in some cases this increases construction costs. Developers find it difficult to opt for green buildings due to price constraints difficulty in sourcing green building materials, technologies and service providers or facilitators in India.

Growing human activity has increased the concern for sustainability even more in recent times. Sustainability in the real estate context is not only limited to energy conservation, but also includes resource usage, impact on the neighbouring environment and working conditions for tenants. This concern has led to the development of green buildings. The green building concept broadly integrates many interests and aspects of sustainability emphasising reduction of environmental impacts through a holistic approach to land and building uses and construction strategies.

A green building uses less energy, water and natural resources than a conventional building. It also creates less waste and provides a healthier living environment



for people living inside it compared to a conventional building. Green buildings incorporate several sustainable features such as efficient use of water, energy-efficient and eco-friendly environment, use of renewable energy and recycled/recyclable materials, effective use of landscapes, effective control and building management systems and improved indoor quality for health and comfort.

The overall benefits of green buildings mostly depend on the extent to which the sustainable features are addressed during the initial planning and design. A green building is most likely to succeed in its objective if sustainable features are envisioned and incorporated right at the design stage. The design has to take into consideration the entire supply chain—from material sourcing, energy modelling, resource reuse, civic amenities and waste disposal to tenant education.

GRIHA Rating System

TERI's green building rating system GRIHA (Green Rating for Integrated Habitat Assessment) has been developed as an instrumental tool to evaluate and rate the environmental performance of a building. GRIHA is an evaluation tool to help design, build,

operate, and maintain a resource-efficient built environment. It evaluates the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a "green building".

It has a few variants, like SVAGRIHA and GRIHA LD (for large developments), which makes GRIHA applicable to all buildings, irrespective of their areas.

SVAGRIHA is a rating system for small homes, offices and commercial buildings with built-up area of less than 2500 square meters. On the other hand, GRIHA LD is a rating system for planning green large developments like green campuses, townships and special economic zones.

Green Building- Myths And Challenges

There are various myths regarding the green building implementation. One example is the myth that sustainability costs more, which ignores recent research as well as the reality that for any society to thrive and prosper, it must seek to create a healthy balance between its environmental, social, and economic dimensions as sustainability is not just about building green but building a healthy community and sustaining a quality of life.

Although green building has made tremendous strides in the past few years, there remain many who still are unconvinced of its benefits due to numerous myths and misconceptions floating around the main stream construction.

- ┆ Green buildings often lack the aesthetic quality of conventional buildings
- ┆ Green building products are often difficult to find
- ┆ Green building products do not work as well as the traditional ones
- ┆ Building green is too difficult and complicated
- ┆ It is difficult or not possible to convert existing conventional buildings into energy efficient buildings

In reality, it is proven that all these myths are the misconceptions of the people, all it needs is better implementation and educating the people about the concepts and contexts of building green.

GRIHA has worked with government construction departments such as Central Public Works Department (CPWD) and has revised their schedules and specifications to adhere to GRIHA requirements, with particular emphasis on Energy Conservation Building Code (ECBC).

CASE STUDIES

Here are a few green building case studies where strategies used have helped achieve significant energy savings and resource optimisation.

IOCL DO Office Building, Indore: Passive Architecture Design

This Indian Oil Corporation building makes use of passive architectural design. Incorporation of passive architectural techniques in a building design helps to minimise the load on conventional systems such as heating, cooling, ventilation and lighting. The building is designed in a way that it reduces direct heat gain, while maximising daylight penetration. Over 82% of total area falls under the day lit zone. 2kWp solar photovoltaic panels have been installed to meet the energy requirements.

Building envelope has been optimised through selection of appropriate wall and roof construction to increase the thermal efficiency. Over 71% of the total open area on site is soft paved and shaded. Turf pavers have been used that allows vegetation growth and penetration of water.

This is a 5 star SVAGRIHA rated project.



Govardhan Eco Village: Soil Biotechnology Design

A green sewage management technology called Soil Biotechnology has been used to, which helps in recovering about 95% of the sewage water and reusing it for landscaping, etc.

It is an attempt towards water conservation and preventing water pollution. This system consists of an impervious containment and incorporates soil formulated granular filter media, select culture of macro organisms such as earthworms and plants. Combined grey and black water from the cottages is collected and transported via underground sewage network to a central location.

The process by design integrates with the natural bio-geochemical cycles of nature. Purification takes place by absorption, filtration and biological reaction. The process operates in aerobic mode, thus eliminating the possibility of foul odour.

The processed water can be reused for gardening, agriculture and supporting marine life.

This project has achieved a 5-star GRIHA rating.



Conclusion

The growing crisis has created the need to adopt the concept of sustainability. Real estate activity, being one of the significant contributors to energy consumption and usage of resources, is working towards the development of green buildings to reduce energy consumption and the environmental impact.

The key challenges for the development of green buildings in India are mostly in the lines of awareness on the benefits of green buildings, materials and technology. GRIHA is working towards addressing these challenges to enable developers to operate with ease.

About Author

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