

Evaluation of an Existing Building for Transforming to Sustainable Building

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Abstract- *When we talk about the green building, there is a great scope of such buildings and these types of construction projects. Generally, green building means that it is eco-friendly and these construction projects do not impact environment in a bad manner. There are some parameters of the building which improves the condition of an existing building and makes building green. In India, there is a need of green buildings and rapidly the green building projects are increasing and the people are understanding the importance of the green buildings. For analysing the existing buildings according to its parameters, there are some rating systems in the market, these rating tools measures the performance of the building and tries to improve the performance of the building.*

Today, various rating tools are available like GRIHA, IGBC, GEM, LEED etc. for giving rating to the building. These rating tools have parameters which evaluates the factors of the building and gives credit points to the building and then these gives certification to the building for green building or not.

Introduction- *In general we will talk about the green building, in green building we will talk about all the features of green building and we will discuss the features which are responsible for environmental balance.*

Basically, Green building is the building which has no negative impact on environment and only positive impacts will be there on the environment. Green building is ecofriendly for the nature and the factors we are using for the construction of green building are very positive for the environment. In green building we can make any building green however it is home , office, or any other building.

In green building we can consider some following factors –

We can use renewable energy sources like sun.

We have to use the materials which can be recycled or reused.

A good indoor air quality should be there.

An efficient use of water resources would be there.

Some waste reduction measures we have to adopt in the designing of green building.

The materials we are using in the green building they should be non toxic and should not be hazardous for the environment.

Rating System of Green Building

When we want to rate any green building then it means we want to know the environmental performance of the building. Actually there are some parameters for the green building , if these parameters are satisfied by the building then we give some points to the building according to the parameters associated with it. There are credits for each parameter of the building and finally we add all the credits of the building then we decide whether the building environmental performance is poor or good.

GRIHA (Green Rating for Integrated Habitat Assessment) Rating System

GRIHA rating system is india's system for rating of the building , this system is developed by TERI (The Energy and Resources Institute) and it is endorsed by the MNRE (Ministry of New and Renewable Energy).

GRIHA rating system try to minimize the resource consumption and waste generation and this system compares the acceptable limits of the materials use which are accepted as a benchmark nationally.

GRIHA rating system adopts five 'R' philosophy which are as follows-

Refuse- We have to adopt the international trends ,materials , technologies , products etc. specially in the areas where local materials are available.

Reduce- It is dependent on high energy products , system and processes.

Reuse- In designing we have to reuse the materials, products and technologies so that we could save money and operational cost occurred in the project.

Recycle- The waste generated from the building site or demolition of the building , we have to try to recycle these unwanted wastes from the site.

Reinvent- Try to reinvent engineering systems and designs so that india could set an example and the whole world could follow our techniques.

GRIHA Criteria and Award points-

GRIHA has 34 criteria and total award points are 100 and for valid certification we have to achieve at least 50 credit points to qualify the criteria of the GRIHA rating system.

If we are availing credit points finally then we can give rating to the building as star rating.

50-60 points are in the category of 1 star GRIHA rated building.

61-70 points are in the category of 2 star GRIHA rated building.

71-80 points are in the category of 3 star GRIHA rated building.

81-90 points are in the category of 4 star GRIHA rated building.

91-100 points are in the category of 5 star GRIHA rated building.

An Overview of LEED- India and GRIHA-

LEED India is known as LEED program and it is administered by IGBC. The main objective of IGBC is to create a sustainable environment and to build a ecofriendly nature surrounding us and IGBC wants to make india a global leader in the path of green building construction. It encourages the sustainable development of the construction and in LEED program there is a rating system and some parameters are evaluated then the construction is certified and in this program three titles are given for certification, these are silver, gold and platinum.

LEED program has various steps for certification including registration, credit interpretation, certification and documentation and certification award.

LEED india basically focuses on five aspects in its program including sustainable site development, water savings, energy efficiency, material selection and indoor environmental quality.

Now we talk about the GRIHA, it is basically removes the drawbacks of the LEED program. In GRIHA we give 1 to 5 star rating to the project for certification. GRIHA focuses on energy or power consumption, water consumption, water generation and renewable energy integration and these factors are different from the LEED program.

GRIHA rating system has 100 credit points and minimum 5 points are needed for 1 star rating so we evaluate all the parameters and add all the credit points then we give star rating to the project.

Research Methodology-

GRIHA for Existing Buildings

Section Name	Criterion Number	Criterion Name	Maximum Point	Anticipated points	Remarks
Site Parameters	Criterion 1	Accessibility to Basic Services	2	0	1. 5 different types of facilities likes (gym, canteen, play area etc. has to be provided. 2. Collective transport facility for people of building
	Criterion 2	Microclimatic Impact	4	2	1. Total of 80 trees are to be planted on site
Maintenance & Housekeeping	Criterion 3	Maintenance, Green Procurement & Waste	7	3	1. Waste segregation has to be done in various streams 2. Contractual tie-ups with recyclers for waste recycling

		Management			3. On site organic waste converter has to be installed
	Criterion 4	Metering & Monitoring	10	0	1. Submetering has to be done for water and energy systems 2. Indoor air quality sensors are to be installed
Energy	Criterion 5	Energy Efficiency	20	8	1. No cost EEMS has to be implemented in the past
	Criterion 6	Renewable Energy Utilization	15	15	-
Water	Criterion 7	Water Footprint	15	4	1. On site STP has to be located for treatment of waste water 2. Efficient plumbing fixtures with low flow aerators
	Criterion 8	Reduction in Cumulative water Performance	10	4	3. Use of onsite treated water for Landscaping and flushing
Human Health & Comfort	Criterion 9	Achieving Indoor Comfort Requirements	8	6	1. Daylight Simulation has to be performed 2. Third party Noise audit report has to be submitted
	Criterion 10	Maintaining Good IAQ	4	2	1. Fresh air quality testing from NABL Accredited Lab has to be done.
Social Aspects	Criterion 11	Universal Accessibility & Environmental Awareness	5	5	-
Bonus Points	Criterion 12	Bonus Points	4	0	1. Urban Farming has to be done on site 2. Net Zero Energy Building via on site solar
		Total (Excluding bonus points)	100	49	
		Anticipated Rating		2 Star	

Conclusion- the authors represented a comparative study of GRIHA rating system with LEED rating system. In this paper some benchmarks are set to make the building sustainable and to avoid the negative impact on the environment. The main target of this paper is to rate the building on energy scale, performance of the building and scope of the building, a small checklist is prepared for certification a project on a small scale.

GRIHA rating system discuss about the various parameters which measures the performance of the building towards the environment but if we talk about the nature of this rating system then GRIHA is complex in nature and it does not give clear explanation of the building performance to the environment, sometimes GRIHA confuses the Indian developers to build a project certified. This paper gives some points which gives a good idea for building so that we can build a project easily and economically.

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