

GRIHA RATING FOR EXISTING BUILDINGS

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ABSTRACT

Population is growing everywhere in increasing manifold and at the same time construction sector has to expand to accommodate this increasing population within and nearby the cities. This increasing demand in construction sector has lead to increase in greenhouse gases. Now India stands second in the world after China in generation of greenhouse gases. Thus there is urgent need to improve energy efficiency of Indian construction sector. GOI is making provisions to manage these increasing energy demands. One of its initiatives is constructing green and energy efficient building. During initiation stage only buildings will be planned to be environment friendly. And at the same time try to make existing building green and energy efficient. The plan is to develop a rating system that will evaluate the building so that it fulfills different criteria to become energy efficient. One such rating system is GRIHA i.e. Green Rating for Integrated Habitat Assessment developed by TERI. Rating is provided to buildings (new as well as old) which further enjoy different incentives from government and at the same time conserve energy and protect environment.

Keywords: GRIHA, TERI, LEED, Rating, Existing Building, Green House Gases.

I. INTRODUCTION

Construction sector in India is in boom with ever increasing demand to accommodate increasing population. But during construction of these buildings they are consuming 30 to 40% of total energy demand of the nation. Buildings basically require energy for activities like heating, cooling, lightning and other appliances and remaining 10 to 20% during construction and material manufacturing. Buildings are prime generators of Green house gases (GHG), thus posing a threat to the environment. Increasing green house gases and Global warming are its consequences. It has caused melting of ice glaciers, increase in sea level and causing submergence of the coastal areas. World is now verge to think a concrete solution for this. Different nations have already started to take steps regarding this issue. Indian government has to take concrete steps in energy conservation, pollution reduction and environment conservation.

II. GRIHA RATING SYSTEM

‘Green Rating for Integrated Habitat Assessment’ (GRIHA) is developed by ‘The Energy and Research Institute’ (TERI). It is tool developed to study and rate the performance of a building as per surrounding environment. Points are awarded for fulfilling the different criteria assigned in rating system. Final score after adding all points will decide the rating of building. Some points are mandatory, will remaining are optional points which are awarded with commitment to meet the requirements for which points are allocated.

1.1. Converting Existing Building into Green Building:

Existing buildings need to be altered to reduce its primary water and energy demands. It possesses a great opportunity in this context. Thus trying to improve performance of existing building and making more sustainable living. During the entire procedure careful monitoring is judgmental to improve its performance in economic way. With the growing stock of buildings, the potential for enhancing resource efficiency in existing buildings is an opportunity to reduce consumption, optimize operational & maintenance costs, and provide the indoor comforts to the occupants. Different rating methodologies and retrofit methods have been developed in recent past. Amongst them GIRHA existing building rating system has been prudently designed to suit as per Indian codes and bylaws. Buildings that are awarded GRIHA rating will get benefits from local authority in terms of tax benefits. Also they get tangible benefits in terms of increases comfort, reduced costs and energy conservation as well as green environment. All types of buildings like offices, institutional buildings, hotels. Hospitals, residence, apartments, etc, whose built-up area is greater than 2,500 sq. m. can apply for certification that is provided by GRIHA for Existing Buildings.

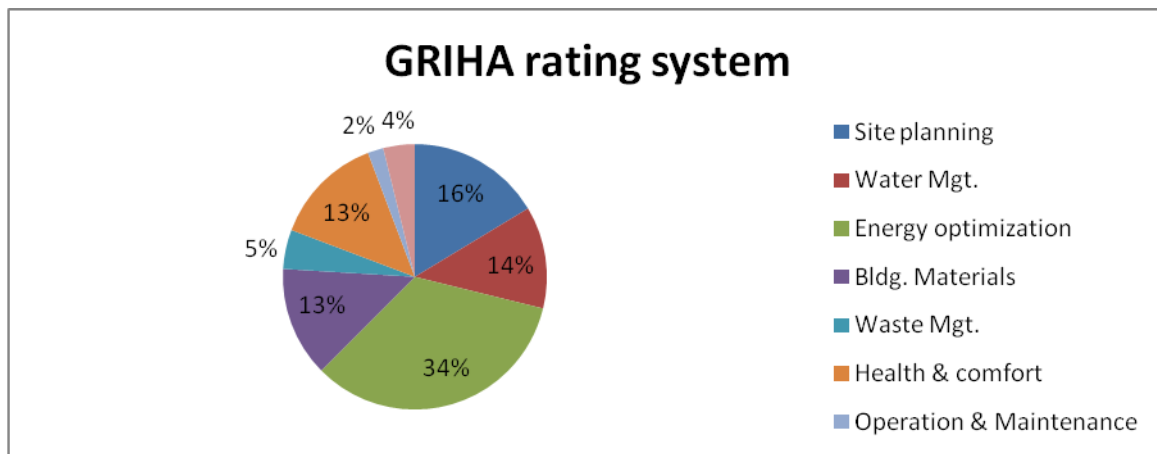


Fig. No. 1 GRIHA rating for existing buildings criteria wise distribution.[1]

Table No. 1. Different Green Building rating system adopted around the globe.[2]

Sr. No.	Rating System	Country	No. of Criteria	Rating type
1	BREEAM	UK	8	Pass, Good, Very Good, Excellent
2	LEED	US	7	Certified, Silver, Gold, Platinum
3	HK-BEAM	Hong Kong	6	Bronze, Silver, Gold, Platinum
4	Green Star-AUS	Australia	9	Best Practice, Australian Excellence, World Leadership
5	GRIHA	India	34	1Star, 2Star, 3Star, 4Star, 5Star,
6	GBI	Malaysia	6	Certified, Silver, Gold, Platinum
7	Green SL	Sri Lanka	8	Certified, Silver, Gold, Platinum
8	Pearl-BRS	Abu-Dhabi	7	1 Pearl, 2 Pearl, 3 Pearl, 4 Pearl, 5 Pearl,



III. METHODOLOGY:

3.1. Grading/ Points:

GRIHA rating consists of different criteria with fixed points assigned to it. Project gets rating based upon addition of all points scored on fulfillment of criteria. Sometimes compliances are specified that need to be met in order to get rating certificate. By carefully monitoring, validation of documents and photographs regarding project, points are awarded to criteria and confirmed to get certificate. For Existing Buildings rating GRIHA has 100 points system consisting of 12 criteria divided in seven sections such as Site Parameters, Maintenance & Housekeeping, energy, Water, Human Health & Comfort, Social Aspects, and Bonus points. Amongst 12 criteria, 6 are mandatory, while the rest are optional. Core points are obtained on fulfillment of mandatory criteria while remaining are scored after fulfillment of compliances promised during inspection. GRIHA certification is given in the form of stars (1 to 5 stars) depending upon number of points scored. Minimum 50 points are required for certification. Buildings scoring 50 to 60 points get 1 star, 61 to 70 points gets 2 stars, 71 to 80 points gets 3 stars, 81 to 90 points shall get 4 stars and 91 to 100 points will get the maximum rating of five stars.[3],[4]

3.2. Process:

GRIHA rating system consists of offline checklist in Excel format. After filling the checklist report is generated that provides the rating as well as provides compliances. Then a third party physical assessment is conducted to check the points scored as per criteria and validate the rating.

Table No 2. Criteria and their Weightage

Section No.	Section Title	Criteria No.	Criterion Name	Intent	Max. Points
I	SITE PARAMETERS	1	Accessibility to Basic Services	Promote walking, cycling and public transport	02
		2	Microclimatic Impact	Lower the impact of UHIE, and promote plantation of trees	04
II	MAINTENANCE & HOUSEKEEPING	3	Maintenance, Green procurement and Waste management	Ensure good practices for safety, waste management and green procurement	07
		4	Metering & Monitoring	Promote reliable metering and monitoring	10
III	ENERGY	5	Energy Efficiency	Ensure energy efficiency	20
		6	Renewable Energy Utilization	Promote use of renewable energy	15
IV	WATER	7	Water Footprint	Implement potential water conservation strategies	15
		8	Reduction in Cumulative Water Performance	Reduce overall water demand of the habitat	10
V	HUMAN HEALTH & COMFORT	9	Achieving Indoor Comfort Requirements	Ensure that building spaces provide for thermal, visual and acoustical comfort	08
		10	Maintaining Good IAQ	Ensure good indoor air quality	04



VI	SOCIAL ASPECTS	11	Universal accessibility & Environmental Awareness	Promote accessible for persons who are differently-abled & elderly persons and to increase environmental awareness amongst the building users & visitors.	05
		12	Bonus Points	Adoption and implementation of innovative strategies in improving the sustainability of the project	04

3.3. Rating Procedure:

1. Feasibility Check: With help of online feasibility check calculator available on GRIHA website it is possible to perform preliminary check to find either building is feasible enough for rating process or not. Based upon feasibility check it just gives indication and final rating assessment will be done only after submission of documents. The building must meet the mandatory clauses in order to get eligible for the GRIHA existing buildings rating.
2. Enrollment: Registration is made online on GRIHA website under Existing Building Category.
3. Workshop training: Workshop training is given by GRIHA Council to give detailed information of existing building rating system. Training includes information regarding all criteria and certification process.
4. Documents Submission: Submit project relevant documents online for all criteria
5. Preliminary Assessment: Team of experts from GRIHA council will assess the online documents submitted. First mandatory criteria are checked and if they are fulfilled then optional criteria are touched or else the project is rejected for rating. A preliminary evaluation report is generated.
6. Onsite verification: GRIHA Council performs onsite visit to verify the submitted documents. Report shall be submitted within 7–10 working days after on field visit.
7. Final evaluation: GRIHA Council evaluates documents submitted during preliminary evaluation. After detailed study of these documents and onsite visit report, GRIHA Council prepares final score card within 20–25 working days.[5],[6]
8. Final rating – The final score is obtained by adding all points which decides type of rating. The rating is valid for a period of five years from the date of award of rating to the project.

3.4. Reasons For Performing GRIHA Rating:

Thus, it is necessary to think that now is the time to select GRIHA rating system and according to its categories to significantly measure building sustainability and ensure that existing building is achieving environmental performance goals. In short check fitness of building towards becoming green. While performing rating following areas need to be worked out:[7],[8]

Lighting management:

Windows serve as natural source of lighting in building. It is important feature in green building. Whereas artificial lighting are consuming maximum part of energy requirement within the building. Hence proper orientation is important to receive natural light for maximum part of day, month as well as year.

Water conservation:

Water has to be carefully used and conserved for present as well as future generations to come. It can be achieved by intelligent water reuse within the buildings. Water reuse i.e. onsite water recycling of grey water makes maximum utilization of available water and reduces water loss. Now-a-days Rain water harvesting concept is gaining wide exposure and is implemented in many buildings to make use of rain water which would have otherwise run away in drains.

Recycled Materials

Use recycled & reused material are preferred and discourage the use of virgin materials, thereby reducing environmental impacts associated with extraction and processing of scarce natural resources.

Waste management:

Although not much practiced in India, but now people are becoming aware to make proper use of resources like paper, plastics etc. Careful use and reuse of materials will lead to reduced waste. Wastes are generally of two types- organic and inorganic. Organic waste needs immediate treatment otherwise it will lead to various diseases, whereas inorganic waste must either be reduced or processed for further use to reduce stress on nature.

Energy management

Create awareness for use of non conventional energy resources and harness energy from them at site itself using new gadgets that to at reasonable cost.

Health and Comfort of Occupants

The rating system ensures adequate ventilation, daylight and comfort for occupants of building. It encourages measures to minimize indoor air pollutants. Also achieving reduced energy consumption without sacrificing the comfort levels

IV. CONSTRAINTS AND CHALLENGES IN GRIHA RATING:

- a. Lack of information and awareness regarding green building concepts.
- b. Government encouragement needs to be increased. They must provide different incentives to people rating their existing buildings and making them energy efficient green buildings.
- c. People believe that green buildings cost more and have long payback period. Although they fail to count the long term benefits of green building concept.
- d. Green building concept should not be limited to individual building; instead it must be applied to entire city, state or country to make green towns and cities
- e. People need to be made aware and trained regarding reuse of available resources. Reduce the use of conventional energy reserves like fossil fuels.

V. Conclusion

GRIHA rating is stepping stone towards environment friendliness. By checking the existing buildings on scale of various criteria, it will help to determine where the building stands in becoming green building. Since green building is associated with different tangible benefits like cost saving, reduction in energy and water, use lower waste generation, lower maintenance cost and increased comfort of occupants. By rating existing buildings it

will help to reduce carbon stress in developing countries like India. By proper co-ordination between different personnel involved in construction activity, it will help to create sustainable, energy efficient green buildings. It will help to minimize impact on surrounding eco-system. Thus it can be a key element in development of nation.

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