

## Green Buildings towards achieving UN SDGs

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Everyone on the globe is facing challenges as natural resources are depleting fast. There may be direct or indirect causes that will make survival difficult for every living species. All these issues come under Climate Change; it is real-time to react to it to reduce the negative impact of climate change. Now, everywhere urbanization has begun, and the major challenges (environment-related) come during the construction. To avoid all these, Sustainable Development comes into the picture. We cannot stop development, but we can adopt something which reduces the impact of climate change impact. In this context, there are two Sustainable Development Goals as described by the United Nation (UN SDGs), which is directly connected to this.

SDG 9: Industry, Innovation, and Infrastructure

SDG11: Sustainable Cities and Communities

These goals are to promote sustainable development, which leads to reducing the negative impact of climate change. Now the question arises, "what is sustainable development"? According to the Brundtland Report (the UN commission's 1987 report Our Common Future), Sustainable development is described as development that "meets the requirements of the present without compromising the ability of future generations to fulfill their own needs." We humans, to make our buildings aesthetically pleasing, are paying less attention to the building's surroundings and destroying native vegetation to construct which is resulting in environmental degradation.

Would you believe that it's as much as 80% of the total floor heat loss? That's right. It's the old Pareto, 80-20 rule with concrete floors. 80% of the heat is lost through 20% of the total surface, which leads to an increased global mean temperature. So, what is the solution?

The solution is "Green building", also known as "Environment-friendly buildings". Green building refers to both the structure and the processes responsible for constructing that structure, to be environmentally accountable and resource-efficient, throughout a building's life cycle.

There are several features that can make a building 'green' and have the solutions (listed below) corresponding to all three traditional pillars of sustainability.

GRIHA - The National Green Building Rating System:

To describe and categorize sustainable characteristics of buildings of various types and scales, we currently have several standards and rating systems in various regions of the world. Green Rating for Integrated Habitat Assessment (GRIHA) is one of them and is mostly used in India.

GRIHA (version 2019) rating system is divided into ten categories (as shown in the figure). It has a total of 30 criteria points associated with a scale of 100 (+5 innovation). And gives ratings one-star, two-star, three-star, four-star, and five-star based on buildings obtaining mark (out of 100+5).

### Pictures of Green Buildings:



Source: Titan Integrity Campus, Bangalore (Ref: archdaily);



Source: Innovation Park of IITH,



Academic blocks (A, B, and C) of IITH



| Environmental solution         | Economic Solution                     | Social solution                                 |
|--------------------------------|---------------------------------------|---|
| Emissions reduction            | Energy and water savings              | Improved Health                                 |
| Water conservation             | Increased property values and profits | Improved schools                                |
| Waste reduction                | Increased employee productivity       | Improved employee satisfaction                  |
| Improved air and water quality | Reduced operating costs               | Improve air, thermal, and acoustic environments |
| Conserve natural resources     | Decreased infrastructure strain       | Healthier lifestyles and recreation             |

The IIT Hyderabad campus is in its 1st phase of construction. Academic buildings (A, B, and C), boys' and girls' hostels (A to J), and other structures are built as GRIHA-rated buildings. The GRIHA certified buildings of IITH are in the 2nd phase of construction. Innovation Park, new hostels, MSME, CHY, BTBM Buildings, etc ongoing GRIHA project to construct green buildings. The structure and Maintenance Department (CMD) of IIT Hyderabad is trying to construct Green Campus, which is associated with GRIHA project.

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