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GREEN CONSTRUCTION+DESIGN

The Complete Guide to Sustainable Architecture and Design

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Green Infrastructure And Sustainable Building

Overview

The global warming is no longer a concern of future. This is right here staring onto us. Among several other factors, the increasing urbanisation is straightway affecting the living conditions especially in city areas. The construction of houses and other building cannot be controlled as people need habitation and places to work and carry out their business. The multi-pronged impacts are visible on the availability of water, level of air pollution, temperature and host of other things that decide the quality of life. Under these conditions, green building practices are the only way to ensure sustainability.

Green Building Practices

Green building construction technologies can reduce a building's energy and water consumption by 20-30% and 30-35%, respectively. Adoption of sustainable building practices is yet to pick up in a big way in India, as of now only 5% of buildings have been constructed using green technologies. Transition from Grey to Green (G2G) Infrastructure could be a saviour. To achieve this, G2G relies on a four-step planning process that involves

- Mapping existing hydrology and green infrastructure
- Designing and fitting a development or redevelopment project to the site
- Selecting appropriate green infrastructure Best Management Practices (BMPs) for the site, and
- Evaluating how well the project and BMPs fit the site.

Benefits of Green Building Designs

The Green Building constructions should not be seen as compulsions. It is rather an opportunity, as the benefits attached to the Green building practices are multi-dimensional.

Environmental benefits

- Conserve natural resources
- Protect biodiversity and ecosystems

Economic benefits

- Create market for green product and services
- Developers can charge incentives against this service along with additional benefit in FSI
- Operating cost gets reduced

Social benefits

- Improve quality of life
- Minimize strain on local infrastructure

The Status of Green Building Practices and Way Ahead

The thrust has been on highlighting that green buildings create a more sustainable environment through efficient use of energy and conservation of resources and all stakeholders, from developers to consumers, should assume responsibility in this mission. In India, implementation of green buildings can be promoted by standardising norms, offering better incentives, providing robust financial support system and creating awareness among all stakeholders. Increased awareness will boost the green buildings sector and lead to a faster expansion of this important market segment.

Sustainability is one of the key architectural trends in 2018 because of the benefits it reaps:

- Reduced municipal water use.
- Ground water recharge.
- Flood risk mitigation.
- Increased resilience to climate change impacts such as heavier rainfalls, hotter temperatures, and higher storm surges.
- Reduced energy use and associated greenhouse gas emissions.
- Improved public health from reduced air pollution and increased physical activity.
- Increased property values

Green Projects by REPL

Paarth Group launched Paarth ARKA residential project is being built on 11.4 acres with 1.5 lacs sq.ft. (Area) of residential built up area and comprises of EWS/LIG & nursery school.Arka has also received the prestigious Leeds certification for its excellent use of green building concepts. It is designed according to green building Gold rating.Arka has been designed and planned keeping the considerations of stringent parameters for CRISIL Star Rating. The project has received the covered CRISIL rating for its high standards and transparency.

The landscaping and overall lighting features are being handled by the biggest names in the business. The idea is to be uncompromisingly perfect, every time Arka will be one of Lucknow most coveted addresses.

Important features of the project

- Earthquake Resistant structure.
- Rain water harvesting.
- Landscaped garden.
- Use of recycled water in gardens and landscaping.

The green benefits of living in IGBC Gold Certified Paarth Arka Home

- 40% of energy efficiency over conventional building
- 50-75% of indoor areas lit by natural light
- 16-18% energy efficient over IGBC Green Homes Baseline criteria
- 50% of indoor areas with cross ventilation
- 40-50% of Site area as green landscape area
- Zero discharge site through 100% waste water treatment and reuse.
- 35% of water saving over IGBC Green Homes Baseline
- 30% low embodied energy building materials for construction

Under Varanasi Smart City for Varanasi Smart City Ltd (VSCL), REP is working on Kanha Upvan (Gaushala for Stray Cattle) at Chhitauni Village). The site spread over 9.06 acres, is located on the bank of river Ganga at the outskirts of Varanasi. This is an excellent example of green construction in infrastructure domain.

DESIGN ELEMENTS USED

- Solar energy source will be harnessed by installing solar panels on the sheds.
- All the shed are designed as single sloped sheds so that maximum surface area is utilized by solar panels. The slopes of all the sheds are kept towards the South direction so that maximum absorption of solar energy is attained.
- All the cattle sheds are prefab light weight structure, as only temporary structures can be built on the site as per norms.
- Cattle shed have been ethologically designed to give the animal comfortable and safe accommodation
- Since the site lies on the flood plain and there are few area on the site that face water logging, all the cattle sheds are kept at the highest point on the site to avoid water flooding in the sheds.
- All sheds are oriented in E-W directions to have maximum ventilation and daylight
- Minimized hardscape on the site to maintain the natural landscape of the area
- A natural pond is proposed in the low lying area of the site to promote fish culture.
- Surface runoff from the open grounds will be channelized to the natural pond to conserve rain water.
- These open grounds will also be used to grow Green fodder 'Hara Chara' for the cattle.
- A Vet hospital has been proposed to tend to sick cattle as majority of strays has some disease/infection when they are brought to animal shelters.
- Sufficient staff accommodation quarters have been provided on the site.
- River front has also been developed as picnic and scenic spots to attract people from the city to the Gaushala site. This will be a potential source for revenue generation and will aid in running the Gaushala.
- A Bio Gas and Compost plant is proposed in the facility to utilize the animal waste in creating natural gas which will be utilized on site.
- Compost produced from the residue of the Bio Gas plant may also be provided to local farmers to promote organic farming.

DESIGN VIABILITY

The whole complex will be a sustainable complex running on solar power. The cow waste will be used in the bio gas plant to create natural gas that will be used on site and the residue compost from the bio gas plant will be used by the farmers for organic farming.

The model for adopting and implementing energy generation through solar power may be developed with 2 options:

- Supply, commissioning, installation and operation of solar panels by taking the entire cost in the project cost of the project.
- Solar panels will be provided free by the agencies. The agencies will provide required amount of power in the complex on subsidized rates and sell leftover amount to the grid.

Cow adoption strategy will be adapted in the Gaushala. The tourists visiting the Gaushala will have an option of adopting any cattle they wish to and for that they will pay a nominal/apt amount periodically or one time for taking care of that cattle.

About REPL

REPL is also working at multiple Smart City projects including Varanasi, Indore, Kanpur and Dehradun. All the smart city planning has essential green building components incorporated in its planning. These include rainwater harvesting, recycle and reuse of waste water, renewable energy, availability of ample green space etc. Overall, we are definitely moving towards green infrastructure and sustainable building practices. In the coming time there will be greater push required in terms of regulatory practices, advance and cost-effect technology as well as awareness among the builders and common citizen.

[Ms. Ruchi is a seasoned architect with eleven years of experience on designing variety of projects including residential townships, affordable housing, commercial complexes and smart cities. She has expertise in sustainable green building designs and Building Information Modelling (BIM). She has proficiency in working on various technical BIM platforms such as REVIT, ARCHICAD and Solibri. She holds B.Arch degree from Institution of Integral Technology, Lucknow.]

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