SUSTAINABLE DEVELOPMENT

GREEN BUILDINGS MOVEMENT IN INDIA

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Our approach to how we live connects us to the physical world
GREEN BUILDINGS

FUNDAMENTAL PRINCIPLES

- SUSTAINABLE SITE DEVELOPMENT
- INDOOR ENVIRONMENT QUALITY
- MATERIALS SELECTION
- ENERGY EFFICIENCY
- WATER EFFICIENCY
INDIAN GREEN BUILDING COUNCILS (IGBC) EFFORTS IN FACILITATING OVER 4.55* BILLION SQUARE FEET OF BUILT UP AREA, ADOPTING ITS RATING SYSTEMS HAS ENABLED INDIA BECOME THE SECOND COUNTRY IN THE WORLD TO HAVE THE LARGEST GREEN BUILDING FOOTPRINT WITH PROJECTS NATIONWIDE.

ASPIRATION OF 10 BILLION SQFT OF REGISTERED GREEN BUILDING FOOTPRINT, IN 2022 (75 th year of Independent India).
CERTIFICATIONS AND RATINGS FROM VARIOUS GOVERNMENT & NON-PROFIT ORGANISATIONS & AUTHORITIES.

SOME OF THE ORGANISATIONS INVOLVED AND ASSOCIATED IN ASSESSMENT, RATING & PROMOTING GREEN BUILDINGS ARE:

• GRIHA
  Green Rating for Integrated Habitat Assessment

• IGBC
  Indian Green Building Council

• BEE
  Bureau of Energy Efficiency

• ISHRAE
  The Indian Society of Heating, Refrigerating & Air Conditioning Engineers

• GBCI
  Green Business Certification Inc.

• ECBC
  Energy Conservation Building Code

IIA IS ACTIVELY ASSOCIATED WITH ALL OF THESE ORGANISATIONS
INDIAN GREEN BUILDING COUNCIL (IGBC)

IGBC is the **Non profit research institution** having its offices in CII-Sohrabji Godrej Green Business Centre., is India’s first Green Building’s Certification Body and is one of the founding members of World Green Building Council. The vision of the Council is ‘To enable a sustainable built environment for all and facilitate India to be one of the global leaders in the sustainable built environment by 2025".

**ACHEIVEMENTS OF IGBC**

1,793 ORGANISATIONAL MEMBERS
3,958 REGISTERED PROJECTS
4.55 BILLION SQ.FT. GREEN BUILDING FOOTPRINT
1,41,898 ACRES OF LARGE DEVELOPMENTS
2,235 IGBC ACCREDITED PROFESSIONALS
We have only less than 1% potable water.

Rejuvenation of traditional water conservation
- Techniques with step wells (baori’s)
- Rainwater storage tanks & reservoirs
- Dug wells

IIA has partnered with government municipal body in executing Jal Swablamban Abhiyan.

Chief Minister
Water self reliant Movement
FACTORS IN PROMOTING GREEN BUILDINGS

GOVERNMENT
- TAX RELAXATIONS
- BUILDING NORMS RELAXATIONS
- ADDED CHAPTER ON SUSTAINABILITY IN NBC
- INTERNATIONAL AGREEMENTS & COMMITMENTS

CONSUMERS
- INCREASED DEMAND
- INCREASED AWARENESS
- WELL BUILT BUILDINGS, THUS A BETTER BUILT ENVIRONMENT

BUILDERS
- PROMOTIONAL FEATURE
- MARKET DEMAND
- BRAND VALUE
- TAX BENEFITS
- BUILDING NORMS BENEFITS

CONSULTANTS/TECHNOCRATS
- ENCOURAGEMENT THROUGH AWARENESS
- BETTER DESIGNED & ENGINEERED BUILDINGS
GOVERNMENT MEASURES TOWARDS GREEN BUILDINGS

THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE (MOEFCC), GOVERNMENT OF INDIA, OFFERS FAST TRACK ENVIRONMENTAL CLEARANCE FOR GREEN BUILDING PROJECTS WHICH ARE PRECERTIFIED/ PROVISIONALLY CERTIFIED BY IGBC.

VARIOUS STATE GOVERNMENTS PROVIDE ADDITIONAL 5% TO 10% FAR FOR PROJECTS WHICH ARE CERTIFIED BY IGBC.

ALSO, STATE GOVERNMENTS FACILITATE FINANCIAL ASSISTANCE FROM SMALL INDUSTRIES DEVELOPMENT BANK OF INDIA (SIDBI), TO GREEN BUILDING PROJECTS IN THE MSME SECTOR.
PROJECT OWNERS ACKNOWLEDGED A **SEVEN PERCENT** INCREASE IN NET ASSET VALUE WHEN SURVEYED.

ON AN AVERAGE, 18 PERCENT OF THE CLIENTS OF THE CONSTRUCTION INDUSTRY DEMANDED THAT THEIR PROJECTS BE ELIGIBLE FOR GREEN CERTIFICATION.

**Green buildings make good business sense**

IGBC within a short spell of time has clearly demonstrated that constructing green buildings are technically feasible and economically viable. At initial stages of green building movement (2003-2006), the incremental cost to incorporate green building features has been 12 to 18%. Today, the incremental cost of a commercial green building has come down to 3 to 5%. The additional costs gets paid back in about 2 to 3 years with substantial reduction in operational costs.
SUSTAINABLE VERNACULAR BUILDINGS

HOTEL SURYAGARH
RAJASTHAN, INDIA

GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA
HOTEL SURYAGARH
RAJASTHAN, INDIA
Hotel Suryagarh is situated midway between Jaisalmer city and SAM sand dunes about 20 km from the city.

40 acres of barren land with no vegetation.

Client’s brief was to create guest rooms in the existing hotel in vernacular style.

In the later phase the main fort building was surrounded by smaller structures as was prevalent for the use of the ministers and the rich sahukars.

The style was borrowed from the "LUDHARVA", an abandoned village of the rich Paliwals of Jaisalmer dating about 200 years back.

It gave the basic architectural design elements and technique, like post and lintel construction, Indirect lighting (we achieved through clear storey light).

Stone slab roofing and courtyards.
• No steel or RCC was used.

• Jaisalmer stone from within 50km was used for all construction by using different treatments/polish, texture, dressing.

• No other stone is used in the whole construction.

• Babool wood is used for covering the ceiling and minimal wood work.
Court yard, Jharokha & Jalis have been used extensively to control the harsh temperatures, the dust storms and wind speed.
SURYAGARH- HAVELIS

DOME PLAN

DOME CROSS SECTION

DIFFERENT COLOURS SHOWING STONE SLABS AT DIFFERENT LEVELS

DOME FROM INSIDE

SINGLE ROOM HAVELI-TYPE 1 PLAN

LEGENDS
01: ENTRANCE FOYER
02: OTS
03: BEDROOM
04: TOILET
05: PLUNGE POOL
06: DAYBED
07: KITCHENETTE
08: VERANDAH VIEWING THE DESERT
09: OTS PLATFORM WITH JHULA (SWING)
SURYAGARH- HAIELS

VARIOUS APPLICATIONS OF SINGLE JAISALMER STONE

VARIOUS TEXTURES OF SINGLE JAISALMER STONE

JAISALMER STONE IN PILLARS & JALIS

ROUGH JAISALMER STONE IN PATHWAYS FLOORING & POLISHED JAISALMER STONE IN INTERIORS

FIXING OF STONE PILLAR

LEGENDS
01. ENTRANCE POVER
02. BEDROOM
03. KITCHENETTE
04. TOILET
05. TUB
06. OTS COURTYARD SITTING
07. PLATFORM FOR ARTISTS PERFORMANCE
08. VERANDAH VIEWING THE DESERT
09. OTS PLATFORM

SINGLE ROOM HAIELI-TYPE 2 PLAN
SURYAGARH- HAELIS

DOME FROM OLD STRUCTURE
STONE SLABS IN ROOFING
OLD WOODEN DOOR IN LUDHARWA
DOOR ELEVATION HAELI
DOOR IN HAELI

BABOOL WOOD USED TO COVER THE STONE SLABS IN CEILINGS
STONE POST & BRACKETS
TUB MADE OUT FROM JAISALMER STONE
TUB DETAIL MADE OUT FROM JAISALMER STONE
TUB IN SINGLE ROOM HAELI TYPE-2

INSPIRATION FROM LUDHARWA, JAISALMER
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

In the village Gatare 100 Kms from Mumbai

Land area: 63 Acres
Built Area: 15,000 M²
Completion: 2013

Architects: Biome Environmental Solutions

CONSULTANTS:

Electrical: Nagesh SV, MCDBERL Pvt.Ltd
Plumbing: MCDBERL Pvt.Ltd
Structure: Prof. M R Yogananda, Ravindranath Bontadka, Pramod A.V
Contractor: Ravi K
Project Cost: US $ 1,500,000
The project is a retreat for the devotees of Iskcon.

The project includes accommodation facility, seminar halls, prayer and wellness spaces, dining facilities and a cowshed.

The buildings are built on higher harder ground whereby the foundation is minimal.

The buildings are built with locally sourced soil from nearby village and in the site.

The concept was to create an ecological development which addressed resource and skill for building, responsible water use and energy.

Earth is the medium for construction and the development is now is a Centre for technology transfer.

Groundwater management is integrated into the planning. Rain is harvested and treated wastewater is used for agriculture. The waste water treatment is done through Soil Bio Technology.

Solar systems are in place for electricity and water heating, Biomass and Biogas based systems for cooking.
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

Master Plan
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

Water Management: Recharge & Recycle

Water Management
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

Land Management: Enhancement of Existing Land Use

Land Management
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

Resource Management: Site as a Quarry

Resource Management
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

Timeline

2009

2010

2011

2012

2013

2014

Timeline
GOVARDHAN ECO VILLAGE
MAHARASHTRA, INDIA

Community Cottage

Ground Floor Plan

Section AA'

Typical Wall Section
IN Volvement & Efforts of IIA

• Regular Knowledge Sharing Seminars & Conferences from experts dedicated for Green Buildings are conducted countrywide through various chapters of IIA.

• Case studies of existing green buildings are conducted & widely encouraged by IIA throughout the country.

• IIA has partnered with various local bodies and municipalities in developing green and sustainable cities.
INVolvement & efforts of IIA

Representing IIA in ACGSA conference in Bangkok

Discussion with City Mayor on smart & green cities

Tree plantation with Jaipur Mayor during Arcasia

Tree plantation with Jaipur Mayor during Arcasia
World green building council is also having world council meet in Jaipur for 3 days before Green Building Congress, 2017.