Climate Smart Buildings (IGEN-CSB)

Indo German Energy Programme (IGEN)

प्रधान मंत्री
आवास योजना-शहरी
Pradhan Mantri Awas Yojana-Urban

Ministry of Housing and Urban Affairs
Government of India

german cooperation
DEUTSCHE ZUSAMMENARBEIT

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Who Are We

- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is wholly owned by the Government of the Federal Republic of Germany
- We are service providers on behalf of the whole of German Government, mainly for the German Federal Ministry for Economic Cooperation and Development and other Ministries and public sector clients
- Over 50 years of experience and expertise in a range of thematic areas, such as:
  - Energy
  - Environment
  - Climate Change
  - Natural Resource Management
  - Skills & Vocational Training
  - Education
  - Water
  - Health
  - Good Governance

…..and many more!!

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Energy II Environment II Climate Change Natural Resource Management II Skills & Vocational Training

Education II Water II Health II Good Governance…..and many more!!

GIZ India

Business volume exceeded EUR 46 million.

BUSINESS WORTH IN INDIA

321 National, 44 International and 10 Integrated Experts.

TEAM OF DEDICATED EXPERTS

Over 30 ongoing projects running across 31 states and union territories, 23 cities, including Smart Cities, Clean India.

SUPPORTS KEY INITIATIVES

Our work in India is integrated with the 2030 Agenda.

COMMITTED TO SDGS

GIZ India

TRUSTED PARTNER

Collaboration with more than 20 partner organisations, including government and foundations.

Sustainability is the core of our business. A key element is our ongoing dialogue with clients and partners.

SUSTAINABILITY

WELL-VERSED WITH DEVELOPMENT COOPERATION

Successful contribution to 60 years of Indo-German development cooperation.

GIZ India – Thematic Areas

Clean Energy and Energy Efficiency

Sustainable Urban Development

Germany and India are jointly working on

Climate and Environment

Private Sector Development and Inclusive Health Care

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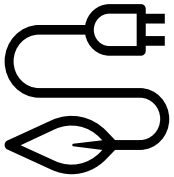
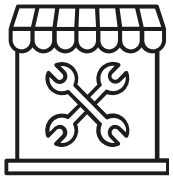
GIZ in India – Impacts



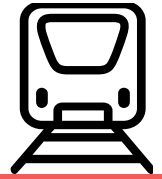
Indo-German cooperation has improved **basic services for 100 million urbanites**



Green Innovation Centres and ProSoil increase productivity and **income of 139,000 farmers** and **rehabilitation and protection of 153,000 hectares of soil**

The Indo-German program for Energy Efficiency saves **over 90 million tonnes CO_2 per year**

Private Sector Development & Vocational Education and Training provided cooperative training opportunities **have skilled 11,000 youth across** 4 Indian states



Climate Adaption projects improve **water security for 2.8 million people.** State climate action plans enhance **climate resilience of 150 million people**

Projects under the Indo-German Partnership for Green Urban Mobility will improve **Metro and bus services for 1.5 million people**

The Indo-German Social Security Programme helped to **insure 454 million people** under **the national health insurance scheme** (PM-JAY)

Technical assistance for the Solar Rooftop sector achieved upskilling of **60,000 young solar engineers**

Climate Smart Buildings

Housing for All

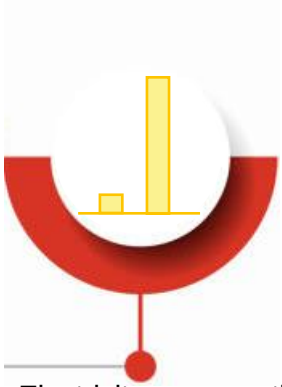
Ministry of Housing and Urban Affairs
Government of India

The Government of India has been implementing its flagship programme- Pradhan Mantri Awas Yojana- Urban (PMAY-U) since 2015 to fulfil the vision of 'Housing for All'.

प्रधान मंत्री आवास योजना–शहरी
Pradhan Mantri Awas Yojana-Urban

Country's building sector is expected to increase **5-fold** from 2015 to 2050

2/3rd of the commercial and high-rise residential structures required in 2030, are yet to be built



Electricity consumption in residential buildings is expected to increase **7-fold** during the period 2012-2032

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Climate Smart Buildings

Federal Ministry
for Economic Cooperation
and Development

The objective of this project is to enhance Thermal Comfort and Energy Efficiency in affordable houses constructed under Pradhan Mantri Awas Yojana (Urban)

Ministry of Housing and Urban Affairs
Government of India

प्रधान मंत्री
आवास योजना-शहरी
Pradhan Mantri Awas Yojana-Urban

Impact

1. Increased Thermal Comfort by 35%
2. Carbon mitigation 20 MtCO2e by 2030
3. E-Learning Platform

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Importance of Thermal Comfort in Built Environment

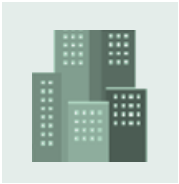
OPPORTUNITY to support thermally comfortable affordable housing

REDUCE THE LOCKED IN ENERGY
We can reduce the demand for air-conditioning by 30-40% !

ENHANCE THERMAL COMFORT
We can improve the health and wellbeing of people

ENHANCE COST & ENERGY SAVINGS for several decades Curtail 30 metric tonnes of CO2!

Support the commitment of GOI towards reducing the CO2 intensity of GDP

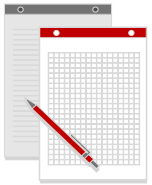


ALTER FUTURE CONSUMPTION PATTERNS of housing stock yet to be built through Passive Strategies in Building Construction

Activities

1. Light House Project Cells

Supporting implementation of Light House Projects & Capacity development on thermal comfort



2. Thermal comfort Action Plan 2047

Development of Thermal Comfort standard, guidelines & Action Plan for phased adoption

3. Replicable Designs

Develop replicable designs for affordable housing typologies to be adopted by developers, architects, home-owners

4. Training Modules

Development of Training Module on Thermal Comfort for widespread dissemination

5. Piloting Construction of Affordable Housing

Technical assistance for Thermally Comfortable Affordable Housing Projects

6. International collaboration

Technical support and mentorship from foreign universities and handholding for incubators.

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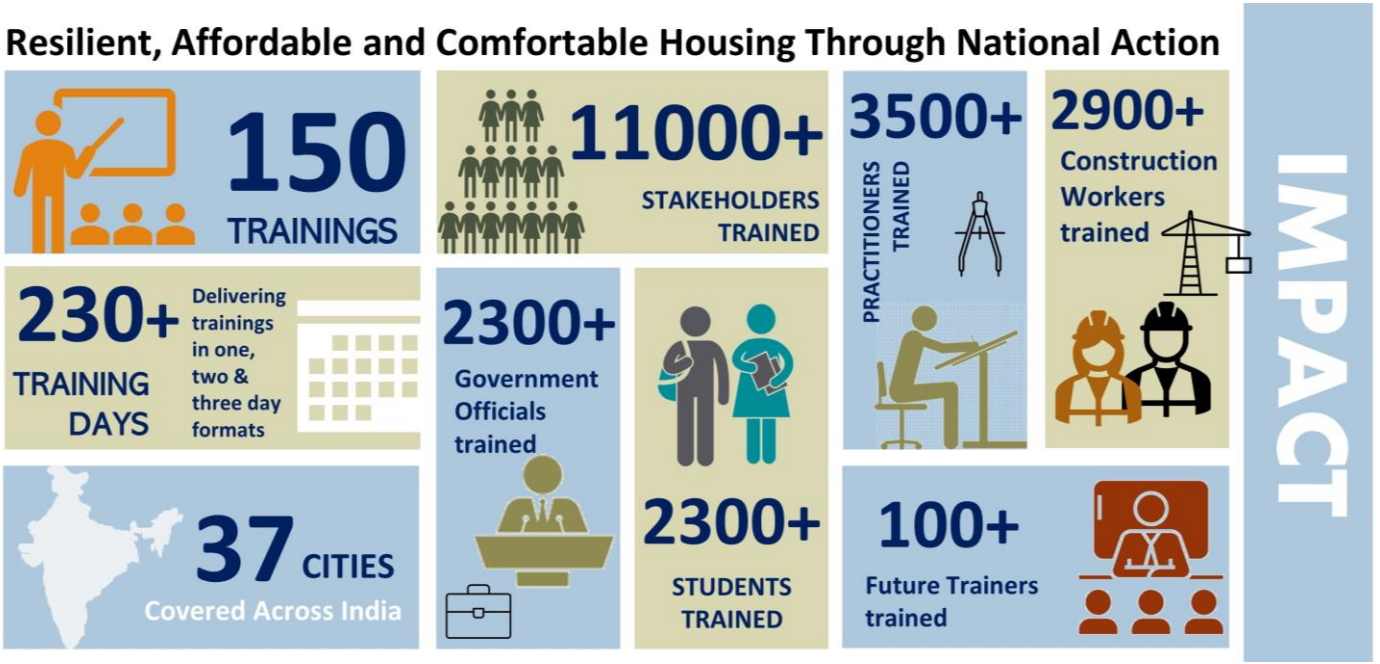
Project Updates

- 150 Trainings conducted on Innovative construction technologies and Thermal comfort in Affordable housing

ghtc-india.gov.in/Content/pdf/rachna/75_Trainings_under_Rachna_Compendium.pdf



GHTC-INDIA : RACHNA

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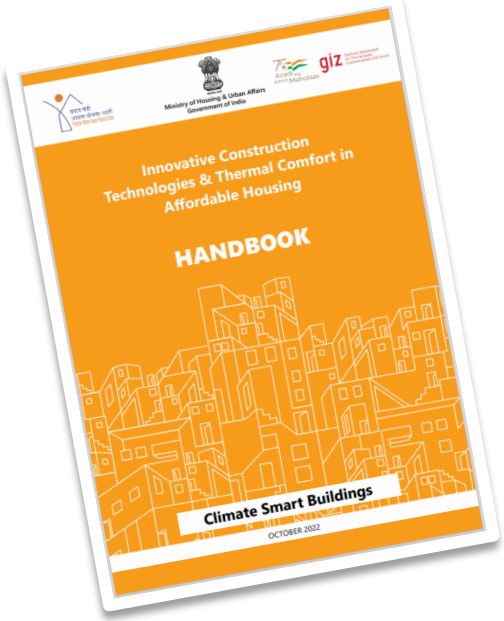
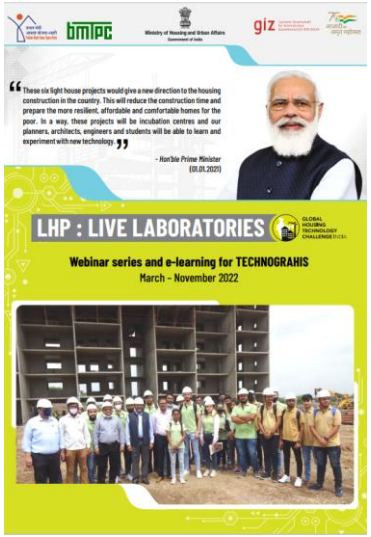
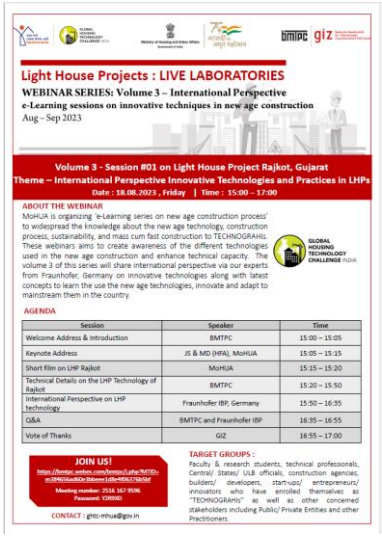
Project Updates

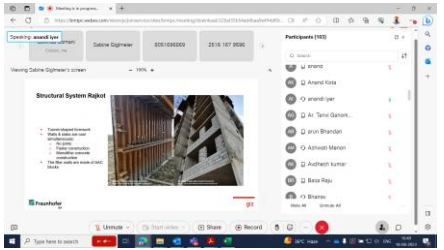
- Knowledge products published and launched for wide outreach
- Webinars and trainings conducted for widespread dissemination

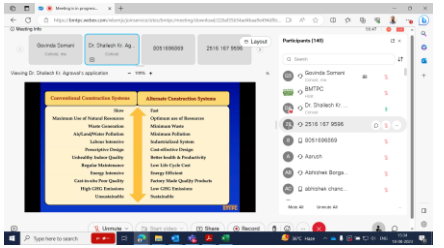


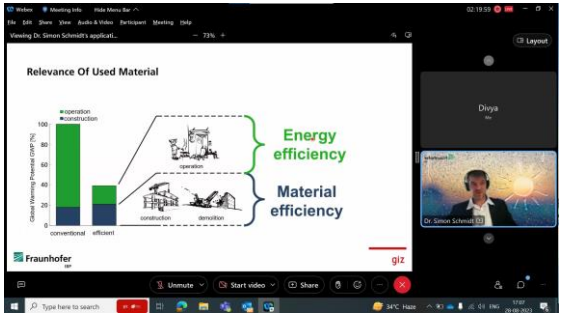
[Rachna_Handbook.pdf (ghtc-india.gov.in)]











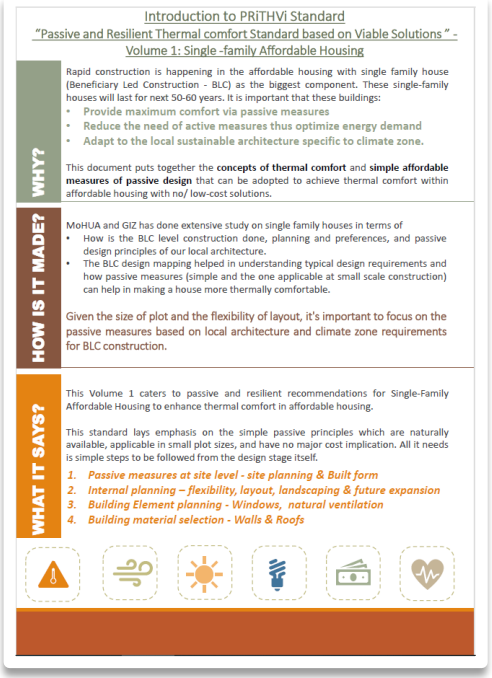
Project Updates

- **PRiTHVi Standard : "Passive and Resilient Thermal comfort Standard based on Viable Solutions "**

- Volume 1: Single-family Affordable Housing

- Volume 2: Multi-family Affordable Housing

Advance Training & Mentorship for upcoming Construction Technologies under ASHA India



Introduction to PRiTHVi Standard

"Passive and Resilient Thermal comfort Standard based on Viable Solutions " - Volume 1: Single -family Affordable Housing

WHY?

Rapid construction is happening in the affordable housing with single family house (Beneficiary Led Construction - BLC) as the biggest component. These single-family houses will last for next 50-60 years. It is important that these buildings:

- Provide maximum comfort via passive measures
- Reduce the need of active measures thus optimize energy demand
- Adapt to the local sustainable architecture specific to climate zone.

This document puts together the **concepts of thermal comfort** and **simple affordable measures of passive design** that can be adopted to achieve thermal comfort within affordable housing with no/ low-cost solutions.

HOW IS IT MADE?

MoHUA and GIZ has done extensive study on single family houses in terms of

- How is the BLC level construction done, planning and preferences, and passive design principles of our local architecture.
- The BLC design mapping helped in understanding typical design requirements and how passive measures (simple and the one applicable at small scale construction) can help in making a house more thermally comfortable.

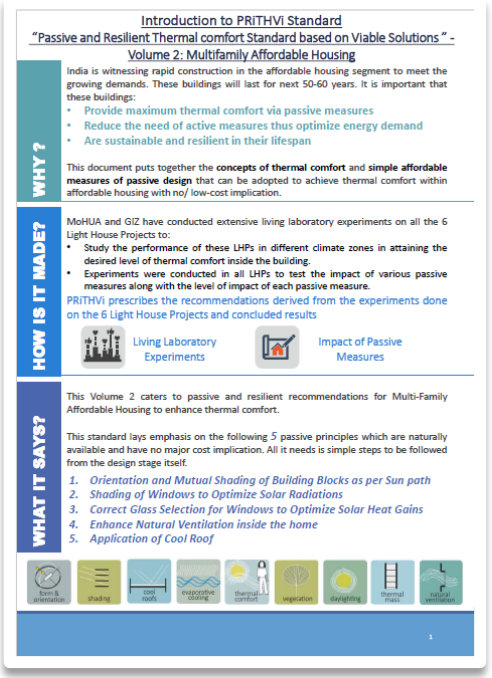
Given the size of plot and the flexibility of layout, it's important to focus on the passive measures based on local architecture and climate zone requirements for BLC construction.

WHAT IT SAYS?

This Volume 1 caters to passive and resilient recommendations for Single-Family Affordable Housing to enhance thermal comfort in affordable housing.

This standard lays emphasis on the simple passive principles which are naturally available, applicable in small plot sizes, and have no major cost implication. All it needs is simple steps to be followed from the design stage itself.

1. *Passive measures at site level - site planning & Built form*
2. *Internal planning – flexibility, layout, landscaping & future expansion*
3. *Building Element planning - Windows, natural ventilation*
4. *Building material selection - Walls & Roofs*



Introduction to PRiTHVi Standard

"Passive and Resilient Thermal comfort Standard based on Viable Solutions " - Volume 2: Multifamily Affordable Housing

WHY ?

India is witnessing rapid construction in the affordable housing segment to meet the growing demands. These buildings will last for next 50-60 years. It is important that these buildings:

- Provide maximum thermal comfort via passive measures
- Reduce the need of active measures thus optimize energy demand
- Are sustainable and resilient in their lifespan

This document puts together the **concepts of thermal comfort** and **simple affordable measures of passive design** that can be adopted to achieve thermal comfort within affordable housing with no/ low-cost implication.

HOW IS IT MADE?

MoHUA and GIZ have conducted extensive living laboratory experiments on all the 6 Light House Projects to:

- **Study the performance of these LHPs in different climate zones in attaining the desired level of thermal comfort inside the building.**
- **Experiments were conducted in all LHPs to test the impact of various passive measures along with the level of impact of each passive measure.**

PRiTHVi prescribes the recommendations derived from the experiments done on the 6 Light House Projects and concluded results

Living Laboratory Experiments

Impact of Passive Measures

WHAT IT SAYS?

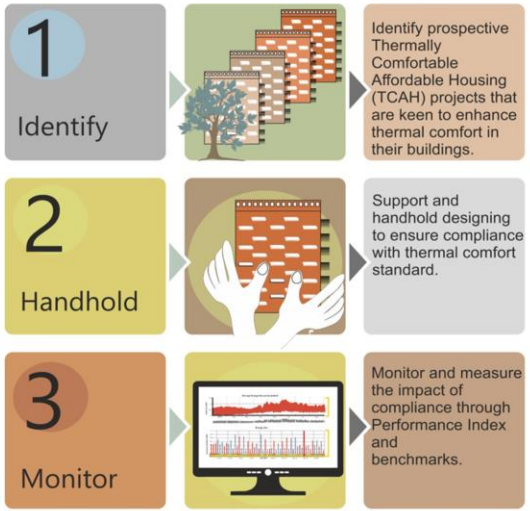
This Volume 2 caters to passive and resilient recommendations for Multi-Family Affordable Housing to enhance thermal comfort.

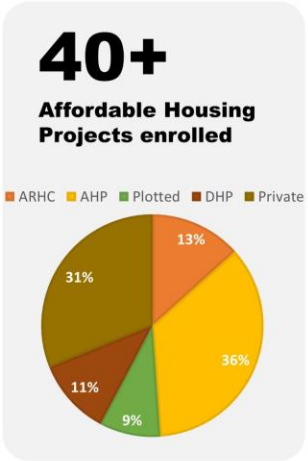
This standard lays emphasis on the following 5 passive principles which are naturally available and have no major cost implication. All it needs is simple steps to be followed from the design stage itself.

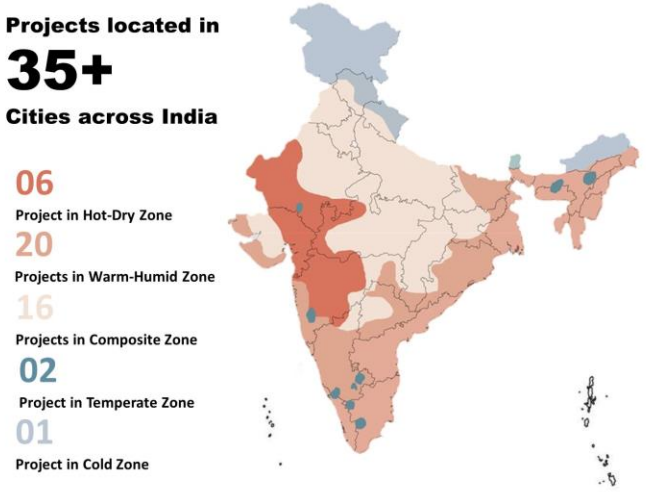
1. *Orientation and Mutual Shading of Building Blocks as per Sun path*
2. *Shading of Windows to Optimize Solar Radiations*
3. *Correct Glass Selection for Windows to Optimize Solar Heat Gains*
4. *Enhance Natural Ventilation inside the home*
5. *Application of Cool Roof*

Project Updates

- **Demonstration Projects for Thermally Comfortable Affordable Housing in India**







Project Updates

- All project activities and knowledge products available on GIZ & GHTC-India website.

https://ghtc-india.gov.in/

Constructing climate smart buildings (giz.de)

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Thank You!