



**GLOBAL
HOUSING
TECHNOLOGY
CHALLENGE INDIA**

75 Trainings
Dec 2022- Mar 2023

RACHINA 2.0

RESILIENT, AFFORDABLE AND COMFORTABLE HOUSING THROUGH NATIONAL ACTION

Trainings & workshops on innovative construction technologies & Thermal comfort for Affordable Housing



**Innovative Construction
Technologies & Thermal Comfort in
Affordable Housing**

HANDBOOK

Climate Smart Buildings

OCTOBER 2022

Climate Smart Buildings
Indo German Energy Programme

Context

The Pradhan Mantri Awas Yojana-Urban (PMAY-U) is a flagship initiative of the Government of India that aims to provide Affordable Housing for all. A Technology Sub-Mission (TSM) has been set up under PMAY-U to facilitate adoption of innovative, sustainable technological solutions for faster and cost-effective construction of houses suiting different geo-climatic and hazard conditions of the country.

Ministry of Housing and Urban Affairs (MoHUA) launched **Global Housing Technology Challenge India (GHTC-India)** in Jan 2019 to identify and source globally available “proven demonstrable technologies” and domestic “potential future technologies” that are sustainable, green, disaster-resilient, cost-effective and speedy through a challenge process which could bring a paradigm shift in construction practices for the housing sector in India.

Opportunity

The homes built under PMAY-U are going to remain with us for the next 6 decades. This presents us with a unique opportunity to build resilient and thermally comfortable homes that avoid the need for cooling and associated energy use in the near future. This will not only mitigate the stress on our environment and infrastructure, but also enhance the affordability and livability of these homes. **The vision of this program is to build capacities to achieve thermally comfortable, resilient and affordable homes through passive design measures, locally available and low embodied energy material coupled with best available technologies in construction.**

The Federal Republic of Germany and the Government of the Republic of India have, under the Indo-German Technical Cooperation, agreed to jointly promote the “Indo-German Energy Programme” (IGEN) with the aim to foster sustainability in built environment in order to use sustainable materials for Thermal comfort and in turn improve the environment and climate conditions. IGEN’s programme, Climate Smart Buildings (CSB) proposes to extend technical assistance to MoHUA for achieving thermal comfort in affordable housing

These 54 technologies were classified into 6 broad categories. Out of each of these Six distinct proven innovative technologies were selected for constructing **six Light House Projects (LHPs)** of about 1,000 houses each with allied infrastructure at **Indore, Rajkot, Chennai, Ranchi, Agartala, and Lucknow**. These LHP’s are serving as Live Laboratories in the country.

Subsequently **84 Indigenous Innovative Building Materials and Construction Technologies** were showcased during **Indian Housing Technology Mela (IHTM)** held in 2021 in Lucknow which can be considered as potential technologies in the second phase of this program.

After successful completion of **LHP Chennai, Indian Urban Housing Conclave (IUHC)** held in Oct 2022 marked completion of second LHP at **Rajkot**.



Rising global temperatures

A frightening reality in times of extreme weather events like heatwaves.



India's energy commitment

Housing for all mission needs to fulfill housing needs without any compromise on environmental concerns.



Thermal comfort for all

Habitants need housing that is thermally comfortable to live in – reducing the need for active cooling means like AC/Desert coolers.



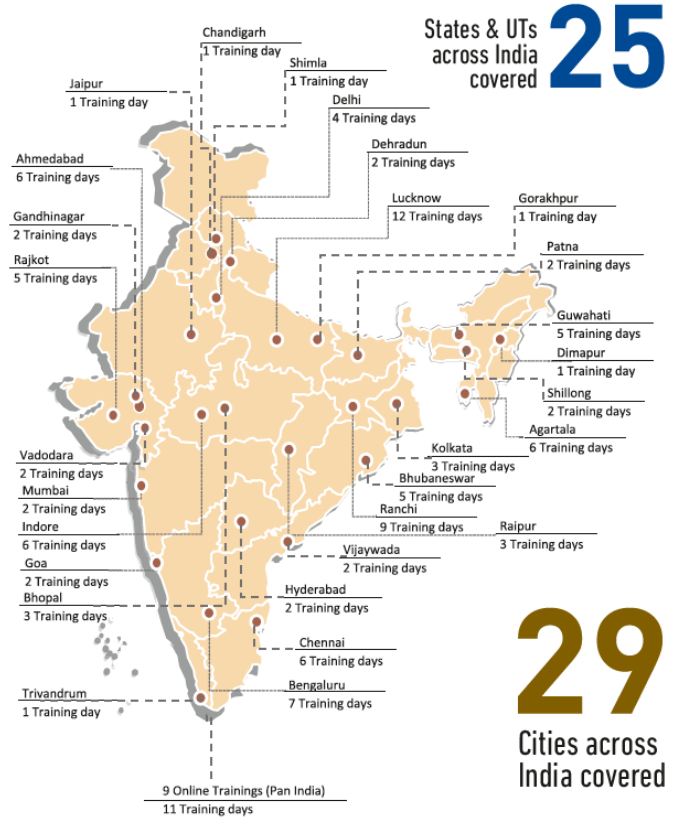
Rising electricity demand

Seven-fold increase in electricity consumption between 2012-2032.

RACHNA 1.0 Success Story

RACHNA- 'Resilient, Affordable and Comfortable Housing Through National Action', is an initiative of Ministry of Housing & Urban Affairs (MoHUA) in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and Building Material and Technology promotion Council (BMTPC). 75 trainings & workshops on Innovative Construction Technologies & Thermal Comfort for Affordable Housing were conducted under this program between April and August 2022.

This not only helped enhance awareness of Thermal comfort but also helped build capacity of Government officials at ULB/State/Centre levels and other stakeholders in various states to promote market transformation. Transformation to climate responsive design and effective use of efficient building materials will contribute to major energy, cost savings and reduction of GHG emissions.



IMPACT

75 TRAININGS

5142 Stakeholders trained

113 TRAINING DAYS

1199 Government Officials trained



36000+ TECHNOGRAHIS ENGAGED

12 design COMPETITIONS ORGANISED



1322 Practitioners trained

39 Expert trainers engaged

12 Academic Institutions involved

1638 Students trained

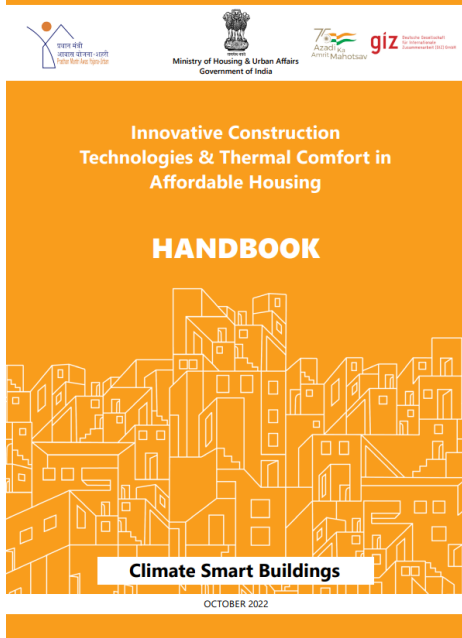
983 Construction workers trained

RACHNA 2.0

A Handbook for training programs on innovative construction technologies & Thermal comfort in Affordable housing was curated and launched by **Hon'ble Prime Minister** at the Indian Urban Housing Conclave in Rajkot. Encouraged by the overwhelming response and participation in the RACHNA 1.0 trainings and to further disseminate the knowledge in this handbook, MoHUA, is launching **RACHNA 2.0**, from Dec 2022 till Mar 2023.

Another 75 trainings and events will be hosted on innovative construction technologies and thermal comfort for Affordable Housing to acquaint various stakeholders from the building construction industry with the nuances of thermal comfort.

The training programs will deliver in-depth knowledge on Thermal Comfort, material influences, and its relationship with building physics, design strategies, construction techniques, low-cost solutions, policy documents, building codes, international practices, and other aspects relevant to thermal comfort in affordable housing. It will also cover topics like thermal comfort study of LHPs and life cycle cost for LHPs, along with no cost design solutions to make a building thermally comfortable and reduce carbon footprint.



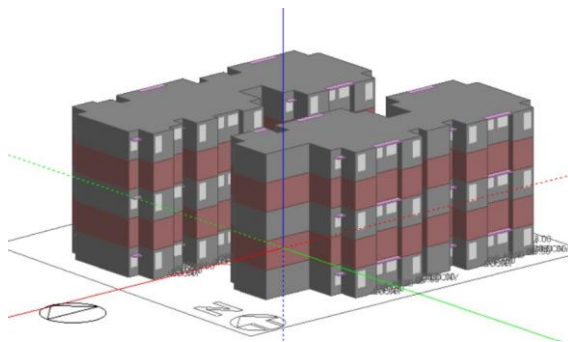
Handbook

Innovative Construction Technologies & Thermal Comfort in Affordable Housing



Thermal comfort Analysis of live Demo projects

A virtual 3D model is developed through computer-based simulation software to analyse the thermal comfort parameters in a project. The trainings will showcase examples of enhancing Thermal Comfort for mass scale application in many such demo housing projects.



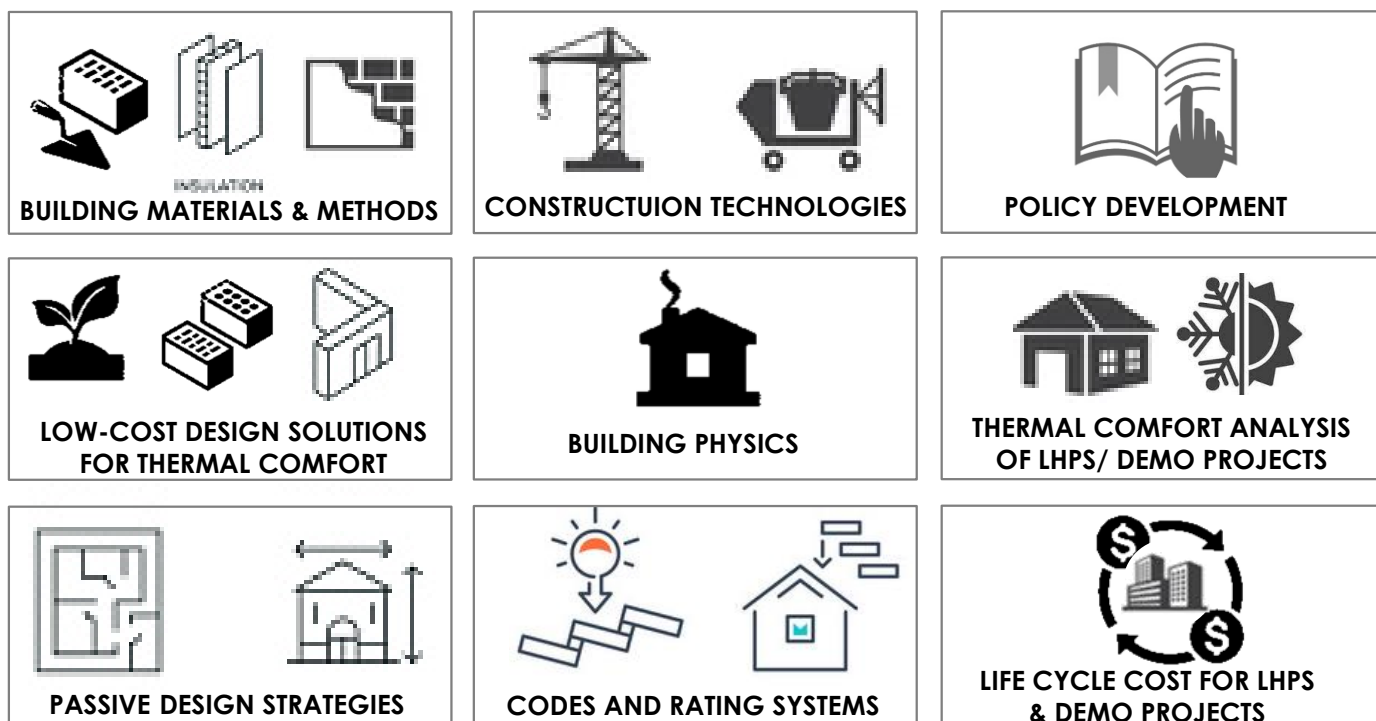
RACHNA 1.0
75 trainings
Mar 2022- Aug 2022

RACHNA 2.0
75 trainings
Dec 2022- Mar 2023



Focus areas & stakeholders

The training programs will deliver in-depth knowledge on Thermal Comfort including the following:



The trainings are designed in one day and two-day formats targeting different stakeholders including government officials, policy makers, academicians, students, architects, engineers, real estate developers, construction workers, masons etc. The trainings' content will focus on the specific geo-climatic conditions of the region they are being conducted in.

Trainings for Built-environment Professionals & Govt. Departments



- Govt. Departments
- Professionals
- Technology providers
- Building sector stakeholders
- Technical officers in public administration

Trainings for Senior Govt. officials & Policy makers



- Head of UDDs, UDAs
- Professionals and senior officials from ULB/State/ Centre Govts
- Govt officials from PWD , engineers and architects from ULBs, TCPO and UDDs

Trainings for Students & Future Trainers



Workshops at Architectural Colleges involving students of architecture, engineering and building design

Vocational Trainings



- Contractors
- Masons
- Field workers
- Insulation applicators

RACHNA 2.0
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