

## LOW CARBON CONSTRUCTION TRAINING

### INTRODUCTION

The construction sector meets one of our basic needs i.e. habitat and shelter. Buildings are constructed to shelter people from the worst effects of weather and climate, mainly uncomfortably hot or cold temperatures, wind, precipitation and humidity. Building construction and operation activities have extensive direct and indirect impacts on the environment as the sector is very resource intensive. The resource footprint during sitting, construction and operation of buildings as well as during extraction and manufacture of building materials is enormous. The sector also contributes substantially to climate change through the large green house gas emissions.

On the other hand, the impacts of the changing climate are also keenly felt by the sector. As the climate changes there is a danger that current buildings in terms of design, location, use of building materials, and technology etc. may not be suitable keeping in mind the various impacts like rising sea levels, increased occurrence of severe weather events, increasing natural disasters, severe water shortages, etc. Also, building materials choices are important in sustainable design because of the extensive scope for impacting sustainability by reducing the embodied energy of the building materials during their extraction, processing, transportation, utilization, and even thereafter.

### ABOUT THE PROJECT

The Government of India has recognised the need for action in the Low Carbon, Climate Resilient (LCCR) sector. However, there is a lack of attention towards the 70 million strong rural spaces and small towns which are emerging as areas of high growth.

“Knowledge Development and Dissemination for Promoting Low Carbon Construction in Rural Areas and Small Towns of India and South Asia” is an initiative undertaken by the Development Alternatives (DA) Group, supported by the Climate, Development and Knowledge Network (CDKN) that aims to bridge this gap.

The initiative has a two-fold focus:

- Mitigation measures against climate change, and
- Adaptive measure to deal with the impacts of this change.

It aims to create an enabling environment focusing on three key factors:

- Knowledge (building a technology base),
- Policy (strengthening the institutional framework), and
- Finance (devising innovative mechanisms).

The initiative seeks to generate knowledge support for LCCR solutions for small towns and rural spaces by building capacity at three levels, viz. Policy Makers, Building Professionals and Artisans. It also attempts to influence policies and building practices in response to imminent climate change trends and need for low carbon construction.

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The initiative zones in on three different geoclimatic regions of the Indian subcontinent – coastal, semi-arid and wet & hilly - with the representative study regions located in Orissa, Madhya Pradesh and Himachal Pradesh (HP) . The LCCR guidelines outlined for these regions have features applicable across similar geo-climatic zones in South Asia.

### Wet hilly region

The state of Himachal Pradesh acts as a model for similar wet hilly regions across the Indian subcontinent as well as South Asia. The wet hilly region in Himachal Pradesh has a rich natural

resource base of forests and water. It regularly faces natural hazards like cloudbursts, flash floods, landslides and being in a seismically active zone, also faces imminent threats from earthquakes. Rich in limestone, cement is one of the biggest industries here and also a big source of environmental degradation and pollution. The region has a rich tradition of climate responsive vernacular architecture based on timber, soil and stone. However, increasing rate of urbanization has resulted in high density construction with RCC frames and burnt brick masonry, thereby displacing traditional practices.

### **Semi arid region**

The state of Madhya Pradesh acts as a model for similar semi arid regions across the Indian subcontinent as well as South Asia. The semi-arid region of Madhya Pradesh has been made resource deficient through relentless deforestation and the resulting soil erosion. In addition, erratic rainfall and the naturally high temperatures predominant in the region have also made water scarcity a prime threat. The climatic extremes prevalent in the region are heat waves and below normal rainfall, which is likely to increase the frequency of droughts if appropriate measures are not taken at this stage. Being rich in mineral resources, the state faces a huge challenge in sustainable extraction of resources. Stone, one of the biggest resources is also a common building material. As a result, stone crushers in the state have become a major source of stone dust - a waste material and an environmental hazard. Traditionally, buildings are constructed using stone, burnt clay bricks and tiles. There is a rich tradition of brick architecture, which is now declining in favour of building elements which use cement concrete and steel. Sandstone slabs on steel girders are a common roofing technique for construction of flat roofs.

### **Coastal region**

The state of Odisha acts as a model for similar coastal regions across the Indian subcontinent as well as South Asia. The coastal region in Odisha is characterized by high temperature and humidity and a high frequency of cyclones and floods of varying intensity, almost every year. The problem is exacerbated by the rise in maximum temperatures, with heat waves also being witnessed in the coastal belt. Apart from temperature, the major climate change impacts in this region are increase in sea level and shifts in rainfall patterns leading to floods and loss of subsistence resources. Being a mineral rich state is resulting in rapid industrialization with problems of uncontrolled mining, thinning of forest cover and soil degradation. Rural habitat in Orissa is largely built with unstabilized earth, stones and thatched or tiled roofs, which have very low resistance to the frequent cyclones and floods. With the rising number of thermal power plants in the state, there has been a surge in use of fly-ash bricks.

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### **Training Module for Policy Makers**

This module specifically looks at LCCR construction for policy makers. The target group includes executive & political decision makers at state and district level. The objective of the module is to impart knowledge on design and planning of resource and energy efficient buildings. This module is intended to serve as reading material for the capacity building of policy makers in LC-CR construction. The module contains

- Training Module Guide
- Agenda of the workshop
- Background reading for specific region

- Presentations
- Case Study posters
- Group Work Guidelines

Download Now: [Wet & Hilly \(HP\) Policy Module](#)

Download Now: [Semi-Arid \(MP\) Policy Module](#)

Download Now: [Coastal \(Odisha\) Policy Module](#)

### **Training Module for Professionals**

This module specifically looks at LC-CR construction for professionals. The target group includes architects, civil engineers, and project managers of sustainable / low carbon habitat projects. The objective of the module is to impart knowledge on design and planning of resource and energy efficient buildings. This module is intended to serve as reading materials for the capacity building of building professionals in LC-CR construction. The module contains

- Training Module Guide
- Agenda of the workshop
- Background reading for specific region
- Presentations
- Case Study posters
- Group Work Guidelines

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### **Training Module for Artisans**

This module specifically looks at LC-CR construction for artisans. The target group includes artisans, masons and supervisors of sustainable/ low carbon habitat projects. The objective of the module is to impart knowledge on constructing resource and energy efficient buildings. This module is intended to serve as a practical guide for the capacity building of artisans in LC-CR construction.

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