



SUSTAINABLE BUILDINGS

Sustainable Habitat Program
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The Energy and Resources Institute
New Delhi, India

MESSAGE

I am delighted to present the first newsletter (April, 2020) for Sustainable Buildings, TERI. As part of the Sustainable Habitat Program, the division strives to promote low-carbon, low-cost solutions to developmental concerns in the built-environment. In light of the COVID-19 pandemic, the current projected GDP growth for India stands at a meager 1.9% for FY21. It is critical at this juncture to envisage a “new normal” for a post-lockdown scenario which can integrate the principles of sustainable development with economic stability, social equity and the lessons learnt during the past few weeks.



Mr Sanjay Seth, Senior Director
Sustainable Habitat Program

Over the next year a slew of new partnerships, collaboration, research activities and implemetaion plans have been planned to meet these objectives. We hope that our stakeholders from the industry, government and academia will continue to support our endeavours. We wish all our readers the best of health.

<https://www.teriin.org/buildings>

ENHANCING SUSTAINABLE DECISION MAKING

The availability and uses of information are issues that affect all aspects of the Sustainable Development Goals and its implementation. Countries in all regions of the world have made substantial efforts to improve the quality, coherence and cost-effectiveness of data and information-gathering.

In this respect, TERI along with its consortium partners (Oxford Brookes University and Development Alternatives) formed the Mainstreaming Sustainable Social Housing in India Project (MaS SHIP) team in 2017. The project has led to the development of a Decision Support Toolkit (DST) that provides guidelines at the conceptual stage of development to improve the performance of a building and lower its carbon footprint through the appropriate choice of construction material. The success of the project highlights the importance of open source data and guidelines in improving urban infrastructure and ensuring resilience and resource efficiency.

Going forward it is essential to utilize information technology and data analytics to facilitate the ecosystem of sustainable development. However, the technical competencies of such tools are only as important as how far the message reaches.

<https://www.mainstreamingsustainablehousing.org/>

NEWS AT A GLANCE

- Mahindra TERI CoE becomes an **NABL accredited testing facility** for building materials
- The first **solar monitoring station** for Delhi NCR is installed at the MTCoE, TERIgram (pg 3)
- The state-of-the-art waste water treatment technology, **TADOX** is patented (pg 3)
- **ECBC Cells** established in Madhya Pradesh, Karnataka
- Strategic and knowledge partnership with **UNSW, Australia** entered
- **Ground Source Heat Pump** technology using Solar PV demonstrated at Kimin, Arunachal Pradesh

INDIA NEEDS TO BUILD

900 MILLION SQUARE METRES

OF URBAN SPACE EVERY YEAR TILL **2030**¹. THE EQUIVALENT OF BUILDING **TWO NEW YORKS** BY **2030**.



48% OF PEOPLE BELIEVE THAT **LACK OF AWARENESS** IS THE BIGGEST HINDRANCE TO THE MARKET²



INDIA HAS CROSSED **650** MILLION SQUARE METRES OF **GREEN BUILDING** FOOTPRINT AND IT IS PROJECTED TO CROSS **930** MILLION SQUARE METRES BY THE YEAR **2022**³



ENERGY SAVINGS POTENTIAL⁴



RESIDENTIAL SECTOR

55-75 TWH



COMMERCIAL SECTOR

32-42 TWH



NEED OF THE HOUR

BUILDINGS WHICH ARE NET-ZERO WATER WASTE ENERGY CARBON EMISSIONS



WITH NEARLY **70%** OF WATER CONTAMINATED, INDIA RANKS **120TH** OF **122** COUNTRIES IN GLOBAL WATER QUALITY INDEX⁵



54% OF INDIA FACES **HIGH TO EXTREMELY HIGH** (40% AND ABOVE) **WATER STRESS**⁶

INDIA GENERATES **61,754** MLD OF **SEWAGE**⁷

63% REMAINS UNTREATED

INDIA ANNUALLY GENERATES **55** LAKH MT OF **SOLID WASTE** WHICH IS DISPOSED IN OPEN AREAS⁸

90% GOES TO LANDFILLS



INDIA ALSO SAW THE **WORLD'S HIGHEST CLIMATE CHANGE RELATED DEATHS** IN 2018⁹

1.5 MILLION PEOPLE MIGHT DIE EACH YEAR BY **2100**¹⁰

1. Hardeep Singh Puri (2018) High Level Political Forum (HLPF) on Sustainable Development

2. Dodge Data and Analytics, 2016

3. IGBC. (2019). India aims green buildings footprint of 10 bn sqft by 2022.

4. Spencer, T., Awasthy, A. (2019). Analysing and Projecting Indian Electricity Demand to 2030. TERI.

5. NITI Aayog. (2018). Composite Water Management Index.

6. World Resources Institute (2015). 3 Maps Explain India's Growing Water Risks

7. Roy, S. (2020). Wastewater Generation and Treatment – Present Status in India .

8. The Ministry of Environment, Forests and Climate Change (MoEFCC), 2019

9. The Global Climate Risk Index 2020 (2019)

10. Tata Centre for Development (TCD) at the University of Chicago. (2019)

STRATEGIC PARTNERSHIPS & COLLABORATION

In July 2018, Mahindra Lifespace Developers Ltd (MLDL) and The Energy and Resources Institute (TERI) launched the first-ever Centre of Excellence (CoE) for Sustainable Habitat in India. The CoE was founded to leverage state-of-the-art research techniques, tools and performance measurement solutions to boost the development of green buildings in India, and the joint research initiative focuses on developing open-source and science-based solutions for India's real estate sector.

The CoE fortifies the available testing infrastructure in the country by augmenting the limited number of accredited facilities providing thermal testing services for building materials. The Centre seeks to achieve the shared vision of MLDL and TERI, to bridge knowledge gaps and enhance industry readiness to scale up energy-efficient and thermally comfortable built spaces in India.



ENERGY EFFICIENT CONSTRUCTION



ENHANCED THERMAL COMFORT



SUSTAINABLE WATER CONSUMPTION



VISUAL COMFORT & DAYLIGHTING

SUPPORTING PUBLIC POLICY COHERENCE

Enhancing policy coherence and scaling up its adoption is a persistent challenge for India as well as of effective urban governance internationally. It is critical at this juncture to position such topics at the highest level of coordination and arbitration. In this respect, TERI has taken a pro-active approach to support state(s) to implement Energy Conservation Building Code (ECBC) developed by Bureau of energy Efficiency (BEE), Ministry of Power. TERI has set up ECBC cells in Odisha, Punjab, Haryana, and recently in Madhya Pradesh and Karnataka.

In addition to the building code, TERI has also provided training on BEE's Standards and Labelling program to retailers across the country. Having worked towards the implementation of ECBC for the past decade, it is increasingly clear that institutional mechanism for policy development is just a starting point towards establishing sustainable production and consumption.



1750 Retailers Trained Across **32** Cities
5 ECBC Cells across India

tadox TECHNOLOGY INNOVATION

TERI Advanced Oxidation Technology (TADOX) provides end-to-end treatment of Municipal & Industrial wastewater streams having high color, COD, BOD, TOC, dissolved organics, non-biodegradable and persistent organic pollutants (POPs). It involves Advanced Oxidation Processes to oxidize and mineralize pollutants leading to clean, green, sludge free and highly cost effective technology, which could be integrated in current systems at pre-biological, post-biological and polishing stage in order to improve treatment. When placed pre-RO, it prevents bio-fouling, enhance life span and efficiency of RO systems and reduce load on subsequent tertiary treatment. Having small footprint and few hours of treatment, it may also serve as decentralized treatment option as Micro-STP/ETP in Green Buildings, commercial spaces and Industrial units. The technology is ready for commercialization.



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