



Towards sustainable, intelligent urbanisation: Priorities for India

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India is undergoing an unprecedented **urban transition**, with its **cities** set to absorb an astonishing millions **new residents** over the next two **decades**. This poses an enormous challenge – and **opportunity** – to build **habitats** that are economically vibrant, **environmentally sustainable**, and **socially inclusive**. As we plan and design the **urban India** of tomorrow, **integrating sustainability** principles and leveraging frontier technologies will be imperative across urban planning, **smart city initiatives**, and flagship programs like the **Pradhan Mantri Awas Yojana (PMAY)** and **affordable housing** scheme.

The harsh reality is that many Indian cities are struggling with immense **infrastructure deficits**, **grinding traffic congestion**, **toxic air pollution** levels, and severe lack of **affordable housing** options resulting into concrete slum conditions. While our discussion largely centers on **potential solutions**, it's important to acknowledge the diverse perspectives within **communities directly** impacted by urban development policies. Incorporating the voices of local communities, environmental activists, and urban planners is essential for ensuring that initiatives are inclusive and address the unique needs of different stakeholders.

According to **CREDAI's report**, India's **urban housing shortage** is projected to swell to a staggering 96 million units by 2036, with the economically weaker section bearing the brunt. As **urbanization accelerates**, these challenges will only intensify unless bold steps are taken towards more sustainable, intelligent development models.

The concept of **smart cities** provides a powerful framework to usher in this **transformative shift**. At their core, smart cities leverage **cutting-edge technologies** like the **Internet of Things (IoT)**, **AI/machine learning**, **big data analytics**, and **cloud computing** to digitize **urban services** and **infrastructure**. This catalyzes resource **optimization**, enhances resilience, **reduces emissions**, and enriches quality of life. While international case studies offer valuable insights into **best practices**, we must also draw inspiration from successful sustainable **urban development** projects within India. Highlighting examples from Indian cities would demonstrate the **feasibility** and **effectiveness** of these approaches in our local context.

Crucially, **sustainable development** must be the overarching guiding principle for smart city interventions. According to a study by the **Indian Council for Research on International Economic Relations (ICRIER)**, smart cities employing **green solutions** across buildings, **mobility**, **energy** and **governance** could reduce emissions by a **staggering 20-30%**. However, we must also acknowledge the **potential challenges** and barriers in implementation. **Funding constraints**, **bureaucratic hurdles**, and **resistance** to change are significant obstacles that require **practical strategies** for overcoming. By addressing these challenges head-on, we can ensure the successful implementation of **sustainable urban development** initiatives.

Learnings from global examples indicate that **smart cities centered** on **transit-oriented development (TOD)**, **mixed-use development**, walkable neighborhoods and green spaces drastically curtail energy demand and resource footprints. Urban planning strategies promoting compact, high-density vertically-oriented growth through sustainable high-rises, rather than sprawling horizontally, will be critical. **Stringent green building codes**, with incentives for **net-zero** and **positive-energy structures** deploying on-site renewables and recycled materials, are vital. Policy frameworks enabling a transition towards a circular economy model with comprehensive waste recycling capabilities are imperative.

Within this **sustainable smart city vision**, India's PMAY and affordable housing scheme can be a powerful catalyst for **systemic transformation**. By integrating sustainable design imperatives and smart tech solutions into all PMAY projects from the outset, we can essentially create a network of **green, digital urban micro-clusters** across India's townships and metropolises. However, it's important to engage with **potential criticisms** regarding the cost of **integrating sustainability** principles and technologies into affordable housing projects. While critics may argue that these measures could inflate costs, international case studies demonstrate that incremental green premiums are recovered within a few years through efficiency gains. More critically, the **socio-economic-environmental** paybacks in terms of resource security, resilience, and public health vastly outweigh upfront expenses over the lifecycle.

The PMAY framework henceforth should mandate all **new affordable housing developments** to incorporate **rooftop solar**, **smart metering** for efficient energy/water use, **IoT-enabled monitoring** and **control systems**, eco-friendly **construction materials**, **rainwater harvesting**, and **decentralized waste recycling** capabilities. Common areas and supporting infrastructure like water/sewage treatment plants must be digitally-enabled for optimized, resilient performance. Disaster resilience should be a core priority. PMAY homes need to be engineered to withstand **seismic events** and extreme weather through **appropriate location** choices, **structural designs** conforming to hazard-resistant codes, and smart monitoring systems providing advance early warning. Holistic planning encompassing barrier-free access, green open spaces, integrated multi-modal mobility options, and digital connectivity must be the norm.

Financing these greener, smarter urban solutions necessitates innovative collaborations between **government, private sector** and civil society. Solutions could include **municipal green bonds**, **sustainability-linked loans** whose interest rates are linked to environment impact metrics, and a phased transition reallocating fossil fuel subsidies towards catalyzing renewable energy and sustainable infrastructure investments.

Catalyzing a **mindset evolution** prioritizing sustainability along with smart urban planning and governance models will be pivotal as for unprecedented urban transition over the next two decades. Only by harmonizing **ecology, technology** and **economics**, cities become engines of inclusive, climate-resilient and resource-secure growth propelling our national development ambitions. Making sustainability and smart tech an inextricable fulcrum of programs like PMAY alongside **masterplans** for India's **100 smart cities** can steer this **systemic transition** – transforming urban habitats into havens of economic dynamism, environmental regeneration and societal wellbeing.