

# SHELTER



| Theme Paper | Policy Review | Case Studies

## G20 – AGENDA FOR SUSTAINABLE HABITAT



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ONE EARTH • ONE FAMILY • ONE FUTURE



## SHELTER

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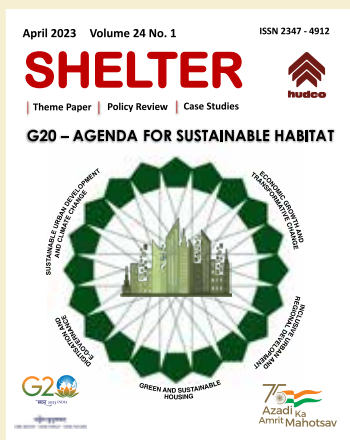
## FROM THE EDITOR-IN-CHIEF

The G20 group of countries collectively represents 75% of global trade and nearly 66% of the World's population. This powerful international economic cooperation group was formed in 1999 after the Asian Financial Crisis. Currently, the group includes nineteen strong economies of the world, as well as the European Union. India has taken over the presidency of the group in December 2022 till November 2023. The G20 is a group for not only international economic cooperation but also has deep links with habitat development as well. Issues such as sustainable development and climate change are not only crucial from an environmental point of view but are also deeply linked to a country's economic agenda and practices. The agenda for sustainable development based upon a foundation of international economic cooperation can play a pivotal role in bringing forward realistic and implementable initiatives for improving the quality of life of our habitat for the generations to come. The G20 countries are committed to achieving the targets laid out in the SDGs and the New Urban Agenda. A parallel process to G20 is the U20 (Urban 20), a group which brings together participating cities from major C40 or UCLG member cities from G20 countries. It focuses on urban issues such as sustainable development, climate change, achievement of the SDGS and challenges of access to finance for the development projects of the cities.

During its presidency, India has drawn inspiration from the Indian philosophy of "VasudhaivaKutumbakam"- One Earth-One Family-One Future. The theme includes various aspects of sustainable development, such as sustainable habitat development, addressing climate change, economic growth and transformative development, urbanisation and digitisation as drivers of urban transformation, inclusive urban planning and green & sustainable housing. The recently held U-20 City Sherpa summit in Ahmedabad also focused on urban habitat development issues such as encouraging environmentally responsible behaviour, ensuring water security, accelerating climate finance, championing local identity, reinventing frameworks for urban governance & planning, and catalysing digital urban futures. The upcoming G20 Summit is an opportunity to revisit the sustainable Habitat Agenda and chalk out a programme for Habitat and Infrastructure development, which is not only contextual but also transformational and futuristic.

The theme for this issue of Shelter, G20: An agenda for sustainable Habitat, focusses on exploring an agenda for sustainable habitat ahead of the upcoming G20 and U-20 Summits. This issue of Shelter features a wide range of issues in three sections. The theme papers highlight various aspects of a sustainable Habitat Development for India in the context of G20. The paper by Hitesh Vaidya focusses on the role of U-20 as a transformational force within the G20, the paper by Reshma Singh highlights the importance of a net zero built environment and its relationship with equitable development and the paper by AK Jain discusses the G20 and a Sustainable Habitat agenda for India. In the policy review section, the paper by Prof Ranganathan underlines the need for an India urbanisation policy-2023. A paper by Vaidya et al discusses the policies for inclusive and barrier free environment and presents a vision of an inclusive India by 2047. Arun Bhandari's paper explores the interrelationship between housing and skill development and Prof Nallathiga explores the interrelationship between Climate change and sustainable urban development. A commentary article by Chattopadhyay et al analyses the current budget provisions for urban development. In the case study section, a paper by Dr PB Salim presents an interesting case study of e-governance project in West Bengal. The section also contains a case study on urban planning and biodiversity in Bhopal by Dr S. Banerjee et al.

I thank all the contributors for an overwhelming response to this issue. I hope the readers enjoy reading this issue of SHELTER and offer their valuable feedback.



## Theme

The G20 group of countries collectively represents 75% of global trade and nearly 66% of the World's population. This powerful international economic cooperation group was formed in 1999 after the Asian Financial crisis. Currently, the group includes 19 countries including India, China, US, UK, Canada, as well as the European Union. India has been an active member of the G20 since its inception. India has also been working to ensure that the developmental issues receive a major focus on the G20. India has taken over the presidency of the G20s in December 2022 from Indonesia and will hold the post for one year. Various events are being held in this connection across the country, and will culminate in hosting of the leaders' summit in September 2023 for the first time in the country's history. During its presidency, India has drawn inspiration from the Indian philosophy of "Vasudhaiva Kutumbakam"- One Earth-One Family-One Future. The theme includes various aspects of sustainable development, such as Sustainable Habitat Development, addressing climate change, economic growth and transformative development, Urbanisation and Digitisation as drivers of urban transformation, Inclusive urban planning and Green & sustainable housing. The upcoming G-20 summit is an opportunity to revisit the sustainable Habitat Agenda and chalk out a programme for Habitat and Infrastructure development, which is not only contextual but also transformational and futuristic.

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## International Training Programme (ITEC) on 'Realizing the Right to Adequate Housing in the Context Of Habitat III New Urban Agenda - Policies, Planning & Practice' January 9th – February 17th, 2023

HUDCO's Human Settlement Management Institute (HSMI) organized the 50th International Training Programme on 'Realizing the Right to Adequate Housing in the Context of Habitat III New Urban Agenda - Policies, Planning and Practices' sponsored by the Ministry of External Affairs (MEA), GoI under its ITEC Programme during January 9th – February 17th, 2023. The programme was inaugurated by Shri Manoj Joshi, Secretary, Ministry of Housing and Urban Affairs, on 11th January, 2023 in the presence of Shri Bibhas Lahiri, Under Secretary, Ministry of External Affairs, Shri M Nagaraj Director Corporate Planning HUDCO, Shri D Guhan Director Finance HUDCO, Dr. Sukanya Ghosh Executive Director Training (i/c), HUDCO's HSMI and senior officials of HUDCO & HSMI.

This Training Programme was attended by 24 delegates from 20 developing countries viz. Azerbaijan, Cameroon, Cote D'ivoire, Ethiopia, Ghana, Iraq, Kyrgyzstan, Madagascar, Malawi, Maldives, Namibia, Nigeria, Paraguay, Peru, South Sudan, Sudan, Sri Lanka, Suriname, Syria & Tanzania. The participants were from government departments with up to 20 years of professional experience. The programme was highly interactive. Various experts and resource persons invited to impart training and interact with the participants included Shri Kuldip Narayan Joint Secretary, Ministry of Housing and Urban Affairs, Prof. Amitabh Kundu, Senior Fellow, World Resource Institute, Mrs. Parul Agrawal, Country Manager, UN Habitat India, Mrs. Banashree Banerjee, independent Consultant & Associate Staff Member, his-Rotterdam, the Netherlands, Prof. Neelima Risbud, former Head & Professor in the Department of Housing, SPA, New Delhi etc. During the six-weeks training programme, the participants were exposed to the concepts and whole range of issues on right to adequate and affordable housing so as to help the international participants design appropriate policies and programmes in the field of housing and habitat development & management in their respective countries for implementation of the commitments under New Urban Agenda as well as Sustainable Development Goals. They were trained to devise strategies, policies, techniques, reform measures, apart from best practices on rights-based approaches to adequate and affordable housing.



*Group photograph of ITEC participants with Shri Manoj Joshi, Secretary, MoHUA, Mr. M. Nagaraj, DCP, Mr D. Guhan, DF and other senior HUDCO officials on the inaugural day.*

# URBAN 20: A KEY INGREDIENT FOR GLOBAL TRANSFORMATION

## DURING INDIA'S G-20 PRESIDENCY

**HITESH VAIDYA**

*“Urban20 is a unique engagement group in the entire spectrum of G20 working streams. While other working groups and engagement groups have experts or representatives of specific organisations, U20 mirrors the G20 itself as members of this group are actually representing people from cities of G20 countries. In fact, with the focus of India’s G20 presidency on ‘jan bhagidari’ i.e., taking G20 to the people, the U20 engagement group is the apt vehicle to do exactly that and bring forth the voice of the people to the global platform.”*

*The article gives an overview of the Urban20 (U20) engagement group under the G20, its objectives, history and current focus and priorities under India’s G20 presidency. Faced with critical global crises such as climate change, forums such as G20 have a major role to play in steering intergovernmental dialogue, policies and actions towards sustainable and equitable development to go hand in hand with economic growth. Cities exemplify this dichotomy and can be a powerful force to take up this role as the environmental impact of urbanisation and urban living is the largest and at the same time, global economic growth is also concentrated in cities. The U20 engagement group is therefore at a stage where it can shape global agendas.*

### G20 AND U20

The Urban 20 (U20) Engagement Group was created under the G20 to focus and amplify the voice of cities and foreground urban issues in the negotiations and decisions of the Heads of Governments of G20 countries. U20 is a city

diplomacy forum that strives to establish a practice of engagement among cities from G20 countries to develop a collective message that emphasises the role of cities in taking forward the sustainable development agenda. U20 was launched in December 2017 at the ‘One Planet Summit’ in Paris under the leadership of the Mayors of Buenos Aires and Paris with C40 and UCLG as joint conveners. Since 2017, there have been five cycles of the U20 chaired by Buenos Aires (2018), Tokyo (2019), Riyadh (2020), Milan and Rome (2021), Jakarta and West Java (2022) and Ahmedabad for the 6<sup>th</sup> cycle U20 (2023).

The larger objective of U20 is to raise the profile of urban issues in the G20 agenda and take the unique perspective of cities to the global forum. U20 also strives to establish collaboration and cooperation among cities through knowledge sharing with specific focus on challenges of climate change and Sustainable Development Goals (SDGs).

**Key Words:** G20, U20, India, Transformation, SDGs

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Urban 20 is a unique engagement group in the entire spectrum of G20 working streams. While other working groups and engagement groups have experts or representatives of specific organisations, U20 mirrors the G20 itself as members of this group are actually representing people from cities of G20 countries. In fact, with the focus of India's G20 presidency on '*jan bhagidari*' i.e., taking G20 to the people, the U20 engagement group is the apt vehicle to do exactly that and bring forth the voice of the people to the global platform.

Every U20 cycle commences with the acceptance of the G20 presidency by a particular country and continues till the handover to the next country. Two key meetings are held during the cycle namely, the Sherpa Meeting and the Mayoral Summit. These are planned to take place before the G20 summit so that the deliberations in the former two can inform the latter. The participants are city sherpas (officers from city government) and mayors or lead representatives from the U20 cities. Two groups of cities come together under U20 - Participating Cities from G20 countries and Observer Cities that are invited by the chair city for a particular U20 cycle.

The U20 Communiqué for the sixth cycle will be led by Ahmedabad and developed with inputs from U20 cities. In this endeavour, Ahmedabad will be supported by the Ministry of Housing & Urban Affairs (MoHUA), the nodal Ministry for U20; the National Institute of Urban Affairs (NIUA), the U20 Technical Secretariat; the U20 conveners, C40 & UCLG and other key knowledge partners.

### PRIORITY AREAS FOR U20

During India's Presidency of the G20, the U20 will underscore the importance of transforming the urban sector to drive lasting positive outcomes for the world. Ahmedabad as the Chair city for the sixth U20 is soliciting the solidarity of cities to collectively find common solutions that are in harmony with the overall objectives of the G20 and its theme of '*Vasudhaiv Kutumbakam*' meaning 'One Earth, One Family, One Future'. In the current cycle, six priority areas have been identified as critical for inspiring city level actions to respond to global agendas. These priority areas were identified by undertaking an analysis of previous U20 Communiqués through which it was inferred:

- Some priorities covered in previous cycle need

continued attention in this cycle; and

- Some priorities had been touched upon in previous cycles but needed reinforcement.

Further, an overview of issues being brought forth by SDGs, COP27 etc. was also carried out as the SDGs call for a paradigm shift that will 'leave no one', in line with the World Habitat Day 2022 theme of "Mind the Gap: Leave No One and Place Behind". Both also recognise the leading role of local governments in definition and implementation of inclusive and effective urban policies and legislation for sustainable urban development.

Based on the above, the following are the priority areas of the sixth U20 cycle. These will be further developed by collaborative deliberations among the U20 cities to prepare a purpose-driven Communiqué:

1. Encouraging Environmentally Responsible Behaviours;
2. Ensuring Water Security;
3. Accelerating Climate Finance;
4. Championing 'Local' Identity;
5. Reinventing Frameworks for Urban Governance and Planning; and

## 6. Catalyzing Digital Urban Futures.

U20 is a platform for cities to exchange knowledge and showcase the innovative and pioneering work they have undertaken. However, it also has the responsibility to champion sustainable development globally through the force of cities. It can create a framework that will enable the global community to translate its commitments for a desirable urban future. Following are the key goals the sixth cycle and its key stakeholders intend to achieve:

1. Moving from 'intention to action';

2. Maximising convergence with G20;

3. Mobilising the Partner Ecosystem;

4. Making knowledge the currency among cities; and

5. Magnifying the role of cities in formulating global policies.

### AMPLIFYING THE URBAN PERSPECTIVE IN G20

It is time to amplify the voice of cities to situate the urban perspective in global forums such as the G20. This has already been recognised by the Group of 7 (G7) as the Urban7 (U7) in 2022

and the Japan Designated Cities Mayors' Association in 2023 were special groups under the G7 to collect voices from local leaders and cities. The G7 Communiqué in fact acknowledges "We acknowledge the significant role of cities, their associations, and networks as actors in our transformation towards sustainable development. We commit to foster exchange among and with cities." As the world moves forward towards achieving the SDGs, Cities can indeed help enhance the collective action needed to create pathways of cooperation that ensure that no one is left behind.

## THE G20: HOW IT WORKS

The G20 group was created as a response to the financial crisis of the 1990s and was a Finance Minister level event till 2008. The first meeting of the G20 was held in Berlin in 1999. In 2008, it became a Summit of the heads of Government, which was hosted by the US in Washington DC. The Chair of the group is rotated annually among members, giving representation to each different regional group by rotation. The Troika or the grouping of past, present and future Chairs of the group, are part of the management group of the G20.

The preparation process of the G20 involves various meetings held in two tracks, namely the Sherpa track, and the Finance track, that discuss and follow up on issues and commitments of the Summits. The Sherpa track focusses on the non-financial issues such as climate change, sustainable development, food security, etc., whereas the financial track focusses on the financial and economic issues. The thematic agendas of various tracks are supported by the background work of the expert working groups as well as through various ministerial meetings.



# ADVANCING NET-ZERO BUILT ENVIRONMENTS: PROMOTING EQUITABLE WELLNESS FOR ALL

**RESHMA SINGH  
YASHIMA JAIN**

*“The fast growth of building floor space and energy use intensity underscores the rapid growth of building operational energy demand. For residential buildings, it is projected to grow from 400 TWh in 2020 to 2000 TWh in 2050, 5 times higher. In the commercial sector, total energy demand is projected to increase from 150 TWh in 2020 to 930 TWh in 2050, almost 7 times. To slash the building sector’s energy use and CO2 emission, it is critical to implement buildings that consume low energy in both their production and operations.”*

**Key Words:** Net Zero, connected communities, decarbonisation, energy

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*The built environment is the converging platform where otherwise discrete sectors of the economy become integrated, such as residential, commercial and institutional buildings, appliances for cooling, ventilation and air quality, transportation, and energy infrastructure including distributed energy resources, each with their associated embodied and operational emissions. Hence, to combat climate change, it is important to develop policy, investment, and technology frameworks focused on driving decarbonisation of the built environment. No building is an island, and action on a community scale is where the potential benefits of decarbonising the built environment are accrued. Net-zero Connected Communities are whole campuses or neighbourhoods with energy-efficient homes, offices, shops, and other buildings, each with smart appliances and all powered by on-site renewable generation providing energy resilience and wellness. Electric vehicle charging stations and energy storage abound, and all the buildings are knit together by a community smart grid with digital interconnections.*

*This vision can be enabled with long-term policy and regulatory capacity and improved investment decision-making for sustainable built environment and economic growth. This will also help advance India’s decarbonisation, innovation, and energy security goals.*

## BACKGROUND

As the world’s fourth-largest economy, third-largest global greenhouse gas (GHG) emitter, and fourth-largest electricity consumer, India stands as a leader in climate action. The nation is on track for 270 million people set to be added to its urban population over the next two decades, with the rise of 7 megacities (IEA, 2021). India’s modern transitions (rural-urban migrations) and increasing (though disparate) wealth has implied almost a similar scaling of per capita energy increase in the past couple of decades, with its co-issues of increasing energy waste, pollution, and emissions. Relative to GDP, India emits twice as many GHGs as the world average (USAID, 2019). Urban areas are becoming increasingly vulnerable to extreme heat, flash floods,



water stress, droughts, and deteriorating air quality. The built environment is the converging platform where otherwise discrete sectors of the economy become integrated, such as residential, commercial, and institutional buildings, appliances for cooling, ventilation and air quality, transportation, and energy infrastructure including distributed energy resources, each with their associated embodied and operational emissions. The COVID19 pandemic has drawn a sharp focus on the nexus between the built environment and health (Singh et al., 2021). Hence, in order to combat climate change, it is critical to develop policy, investment, and technology frameworks focused on driving decarbonisation of the built environment.

## INTRODUCTION

At the UN Climate Change Conference 2021, India's Prime Minister Narendra Modi announced a target of *net zero emissions by 2070*, to reduce projected carbon emissions by one billion tons and the carbon intensity of India's economy by 45% by 2030 (MoEFCC, 2022). India's building sector alone accounts for 33% of emissions for a total of 907 million tons in 2020 (de la Rue du Can et al., 2019). Hence, built environment decarbonisation is at the core

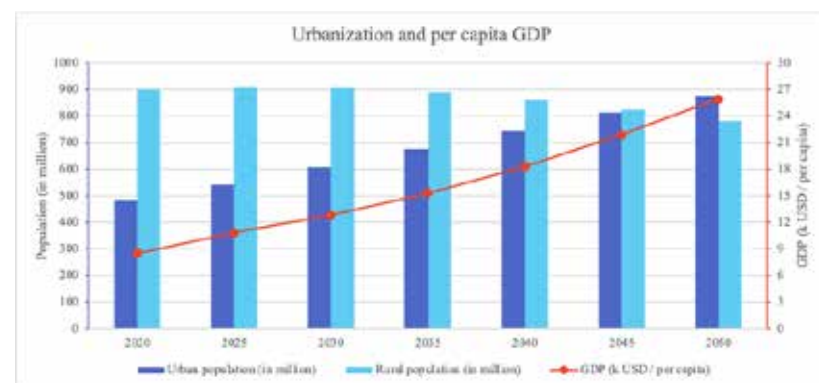
of climate action – it offers cost-effective opportunities for deep carbon reduction and drive co-benefits for the human development index by providing health-inducing spaces and a decent standard of living.

This year India has taken to the global stage with the G20 presidency, embracing the theme of *Vasudahaiva Kutumbakam* or “One Earth, One Family, One Future”, and guiding global actions towards energy transitions to accelerate low-carbon growth and promote an eco-friendly lifestyle. To drive towards this goal, there must be an emphasis on decarbonisation of the built environment, electrification of aligned industrialised processes and end uses; solutions for hard-to-decarbonize steel and cement production, and scaling emerging clean energy policy and technology deployment while serving for wellness and resilience

for all. This is a unique and timely opportunity to accelerate India's leadership on global progress towards net zero embodied and operational emissions in the built environment and to help steer the world away from a dangerous, potentially catastrophic, climate trajectory.

In recent years, India's GDP is enjoying fast growth at approximately a 5% annual growth rate to reach 2.67 trillion USD in 2020 (World Bank, 2021). It is estimated that India's GDP will grow to 1.2 trillion USD by 2050, approximately 5 times increase from 2020. India is also experiencing a rapid urbanisation process – 36% compared with 32.7% in 2015 (World Bank, 2021), and 50.3% by 2050. Figure 1 illustrates India's projected per capita GDP (IMF, 2016) and rural vs. urban population (Our World in Data, 2018). The triple effects of population, urbanisation, and GDP

Figure 1 Urbanization and per capita GDP growth in India



(Source: Our World in Data, 2018)

growth are projected to further exacerbate building sector energy use.

**HOW WE BUILD TODAY SUSTAINABLY, WILL CHANGE THE COURSE OF HISTORY**

Buildings globally account for ~40% of global greenhouse gas (GHG) emissions with building operations accounting for 28%, and embodied CO<sub>2</sub> emissions from materials and construction accounting for 11% (Figure 2). New construction and retrofits of buildings offer significant opportunities for reducing emissions. While curbing energy and resource waste, and using creative circularity are huge opportunities, buildings also are an inherent home for

rooftop solar, wind, energy storage (electric and thermal), and electric transport’s charging infrastructure that makes the context for building decarbonization even more significant. (Singh et al., 2021)

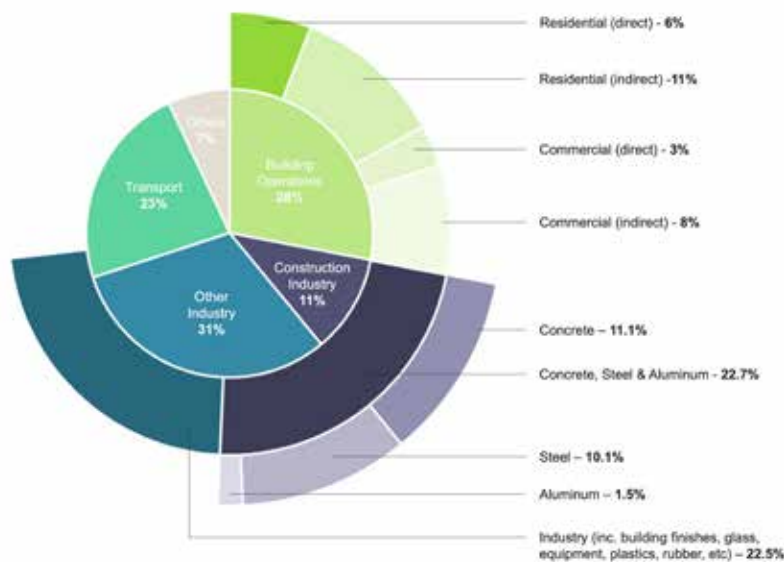
India is projected to become one of the biggest producers of carbon emissions from buildings by 2050. The nation will witness a significant increase in the commercial and residential building stock, also galvanised by national programs such as Housing for All, Smart Cities Mission, and the Prime Minister Awas Yojana Programme. The nation’s building energy use currently accounts for 33% of the nation’s energy use (IEA, 2021). In pre-pandemic years, there was a high growth trajectory of 8% cumulative

annual growth rate (CAGR) in all building sectors, particularly residential, office, and retail. It is estimated that 700 million sq. metres of commercial building space were added over the last decade and projected that 40% of the building stock that will exist by 2037 is yet to be built (IEA, 2021). The upcoming new construction presents a unique opportunity to leapfrog into a low embodied carbon and resource-efficient future by building it responsibly (Alliance for an Energy Efficient Economy, 2018). By incorporating energy-efficient design and construction materials and strategies, buildings can inherently have a reduced embodied energy footprint.

The fast growth of building floor space and energy use intensity underscores the rapid growth of building operational energy demand. For residential buildings, it is projected to grow from 400 TWh in 2020 to 2000 TWh in 2050, 5 times higher. In the commercial sector, total energy demand is projected to increase from 150 TWh in 2020 to 930 TWh in 2050, almost 7 times.

To slash the building sector’s energy use and CO<sub>2</sub> emission, it is critical to implement buildings that consume low energy in both their production and operations. India’s building

Figure 2: Emissions from the buildings and construction sector, showing a breakdown of embodied and operational emissions (Adapted from IEA, 2019)



stock is tripling its energy performance index (EPI) with commercial buildings slated to average an energy use intensity of ~100+ kWh/sqm/year, as compared to indigenous buildings at 30-70 kWh/sqm/year. In Class A office buildings with IT-intensive operations, a growing building typology, EPI is already at ~300+ kWh/sqm/year, a tripling that is attributable to a young aspirational population, exponential growth in cooling loads given the rapidly warming cities, and increasing computational loads and service levels (Singh et al., 2018).

Attaining low-carbon-pathway scenarios for India's built environment may be accelerated through robust benefits of international collaboration. International R&D projects can provide findings beyond what one team could achieve alone by bringing a breadth of knowledge and skillsets and leveraging world-class expertise to conduct specific and projected baseline and mitigation models, data-driven policy evaluations, and technology assessments for various high-growth building typologies. International collaboration can draw upon approaches, tools, and successful technological practices of countries such as the United States. The US state

California has maintained per capita electricity consumption to be nearly flat over the past 40 years despite the GDP growing expansively. This accomplishment is due to investment in research, development, and deployment of more efficient technologies, utility programs that help customers use those tools to lower their bills, and energy efficiency standards for new buildings and appliances (NRDC, 2013). California has implemented policies to achieve net zero new construction through continuously revised and upgraded building codes and standards. California's new commercial buildings are expected to achieve net zero energy by 2030.

Studies conducted at Lawrence Berkeley National Laboratory have found that through cost-effective passive design and active energy efficiency technologies and controls, energy use intensity in air-conditioned buildings can be effectively reduced to an energy performance index (EPI) of ~50 kWh/m<sup>2</sup> in residential buildings and ~65 kWh/m<sup>2</sup> in commercial buildings, and reduced to 30 kWh/m<sup>2</sup> through mixed-mode ventilation strategies. Achieving 30 kWh/sqm/year through energy efficiency relying on a combination of traditional wisdom and innovative

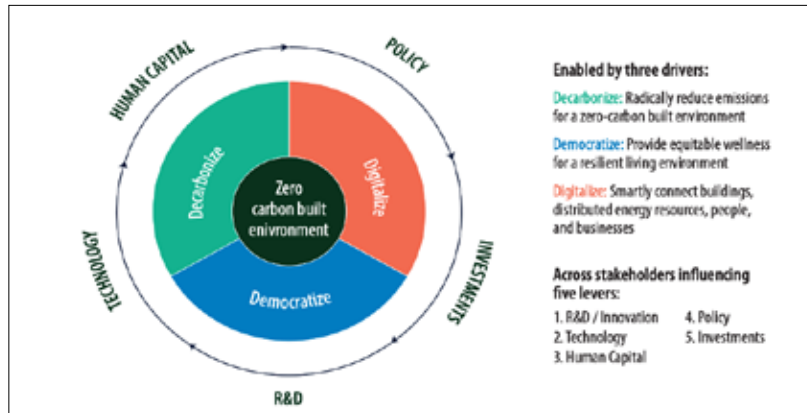
technologies is possible even in commercial buildings (Singh et al., 2018). Vernacular dwellings that have low-carbon construction and operations, have been found to be more resilient to climate change when compared with modern dwellings. There is also increasing realisation and scientific validation in the prudence and frugality underlying vernacular habitations that have as a rule sustained on 'close-looped' local ecosystem services.

## ZERO CARBON BUILT ENVIRONMENT: KEY DRIVERS

Developing a low carbon scenario for India's commercial and residential building sectors may assume that India will gradually develop net zero energy buildings, and net zero energy building annual new construction market penetration will grow to 100% in 2050. A potent vision of a zero-carbon built environment promoting equitable wellness and resilience may be achieved through three critical drivers: Decarbonise, Democratise, Digitalise as shown in Figure 3 (Singh et al., 2021).

The **first driver, decarbonisation** is a fundamental need to address climate change and resilience to withstand global warming and achieve net zero carbon in

Figure 3 A vision for a zero-carbon built environment promoting equitable wellness and resilience through a framework of the three drivers Decarbonise, Democratise, Digitalise.



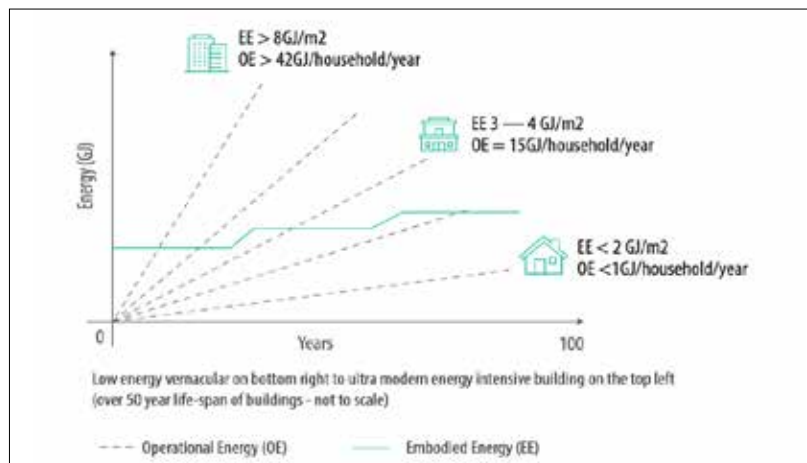
(Source: Singh, Mani, Joshi, 2021)

the Indian built environment by 2050. Decarbonisation represents the largest and most cost-effective levers for climate action and approaches and includes approaches as detailed below:

1. *Reduction in embodied carbon:* Solutions to reduce embodied carbon rely on standards, labelling and green procurement of low carbon materials,

integrating accessible and affordable low-carbon materials, methods, and building assemblies. Figure 4 shows embodied and operational energy for various building typologies. Approaches to reduce embodied carbon include locally sourced and re-utilized/ up-cycled materials, biogenic resources, and structural alternatives. The most

Figure 4: Embodied and operational energy for various building typologies (Mani & Reddy, 2012)



important processes include decarbonised energy-intensive steel and cement manufacturing, and carbon capture, utilisation and storage (CCUS) at cement plants, and harnessing carbon storage potential in buildings.

2. *Reduction in operational carbon:* Operational energy reduction requires progressive approach (Figure 5) that has been shown to provide ~75% reduction in the use of active energy in high-performing commercial buildings. This progressive approach enables deep reductions in capital expenses for renewables required to deliver net zero energy buildings; entails the use of passive design to reduce active energy demand for space cooling, lighting, and appliances; improving energy equipment, monitoring and controls to reduce energy demand and waste; addressing the reduced energy demand using decarbonized energy sources, and implementing flexible building-to-grid management.
3. *Reduction in resource use and waste through circularity of building materials and energy flows.*

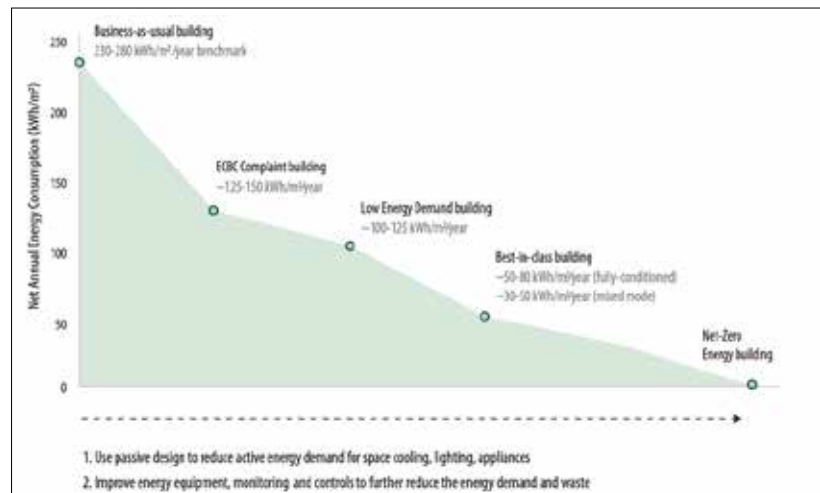


This is a regenerative system in which resource input and waste, emission and energy leakage are realigned to be close-looped involving multiple stakeholders. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing and recycling (Geissdoerfer et al., 2017). For instance, by developing supply chains integrating construction and demolition waste, that represents one of the largest waste fractions by volume, of which only one per cent is recycled in India, and closed loop energy and water systems.

Decarbonisation strategies have the highest potential for reduced operational expenses, climate change adaptation and mitigation, environmental remediation and stewardship that translates to gains along all three aspects of the triple bottom line, people, planet, and profit.

The **second driver, democratisation**, addresses how communities can access affordable climate responsive development with a combination of novel innovation and traditional wisdom to ensure resilience and wellness in the living environment.

Figure 5: Progressive approach for 75% reduction in operational energy. An illustrative example for commercial buildings (Singh et al., 2021)



Democratisation approaches include:

1. *Low-energy solutions responsive to regional and cultural diversity*, and nature-based solutions that are critical for achieving human health and wellness;
2. *Attention to inequity and marginalisation* given the fact that impacts of climate change would impact the poorest and marginalised communities the worst; and
3. Global attitudinal change, particularly amongst the youth, with relation to India-specific constitutional rights and universal Sustainable Development Goals (SDGs).

Democratisation would create equitable opportunity and access to upskilling, housing,

clean energy, wellness, technology, communication and mobility to accommodate emerging aspirations, while reinforcing faith and dignity in regional identity and uniqueness.

The **third driver, digitalisation** provides an integrative platform for effective energy and resource utilisation and conservation in buildings, revitalising ecosystem services and biodiversity for equitable social harmony, health and resilience. Pervasive digitization across the building lifecycle requires strategic growth of national computing and networking infrastructure; digitization of rich non-digital records and design/construction methodologies, and adoption of artificial intelligence on novel sources of data. Digitalisation approaches include:

1. *Connecting buildings and communities across the lifecycle* that can be transformative in achieving decarbonization and democratisation; and
2. *Considering scientific scrutiny on traditional building paradigms* to provide a scientific basis to Indian construction wisdom and its unique regional context. This will unlock digitalization given the radical shift from industrial age to information age.

Digital transformation facilitates decarbonization and democratisation in the built environment through unprecedented value creation to empower stakeholders.

How we build today sustainably, will change the course of history. In the next two sections we detail two significant themes for a sustainable built environment, i.e reduction of active energy demand for space cooling through alternate technologies to achieve equitable thermal comfort and wellness; and the concept of Net Zero Connected Communities.

### **ALTERNATE TECHNOLOGIES TO ACHIEVE “THERMAL COMFORT FOR ALL”**

As an unusually early heatwave struck India in

March 2022, Indian climate scientists warned that while several cities have heat action plans and early warnings for heatwaves, a lot of implemented adaptation remains incremental. Transformational adaptation for heat would involve a complete shift in how we build our cities – more space for nature, more ventilation, revised building codes – how we work – shifting work timings, providing cool shelters for exposed livelihoods – and supporting the most vulnerable who are most at risk.

Given the rapid growth in floor space, extreme urban heat and pollution, increased intensity of energy use, and service level requirements India must address efficiency in this sector, particularly in the highest energy-using end-use: space cooling. The Ministry of Environment, Forest, and Climate Change, Government of India has led the development of the India Cooling Action Plan (ICAP) 2019 (MoEFCC, 2022a) – a macro-level policy tool aimed to manage India’s cooling growth while neutralising the potential harmful impacts and securing socioeconomic benefits. There is also progress through the voluntary Energy Conservation Building Code (ECBC) (Bureau of Energy Efficiency, 2017) that recommends passive

and active technologies to reduce energy demand and has pursued advanced refrigeration to improve equipment efficiency. Other strong macro-level context in India includes Kigali Cooling Efficiency Program (UNEP, 2019), Sustainable Development Goals, India’s Nationally Determined Contribution under the Paris Agreement (MoEFCC, 2022), and Net Zero 2070 (World Economic Forum, 2021).

Cooling for thermal comfort in urban areas is a significant challenge. India is expected to have a 150 GW addition to its peak load due to increased cooling demand alone by 2030, three times the size of California’s peak load (IEA, 2021). As air-conditioning demand explodes, passive measures such as microclimatic vegetation effects, leveraging massing and orientation, natural ventilation and shading can effectively reduce the cooling load. Measures such as cool roofs and cool surfaces not only reduce building cooling load but can also mitigate urban heat island effects, which in turn, improve building air-conditioning efficiency. Studies and experience have shown that ceiling fans can provide good thermal comfort in tropical climate regions and save cooling energy demand. The application of low GWP

refrigerants in cooling and refrigeration systems is another key action to cut non-CO<sub>2</sub> greenhouse gas emissions. Control systems can help buildings to reduce cooling, lighting, and plug loads, and also engage occupants to implement energy savings behaviours.

Hence, the key themes are cooling decarbonization pathways that must include important considerations such as foundational shelter and thermal comfort through passive and active cooling, as well as adequate space, ventilation, and daylighting. Democratisation of cooling can be attained through considerations such as affordable housing that integrates protecting the poor and vulnerable communities from heat stress through nature-based solutions and passively cooled building design, fast adoption of EcoNiwas Samhita (ENS) and ECBC, and widespread scaling of non-refrigerant technologies such as super-efficient fans and air coolers. Further, digitalization solutions such as sensors, metres and controls can help optimise cooling (Figure 6). While cooling is a critical component of the building sector, the connection of buildings to the energy grid is the next frontier for research, development and deployment for attaining a net zero future.

This is detailed in the next section.

### NET ZERO CONNECTED COMMUNITIES (NZ2CS) ARE THE FUTURE

Buildings have a significant potential to transition from being isolated energy consumers to energy efficient and low-carbon active energy prosumers, unlocking the potential for dynamic energy efficiency, load flexibility, and renewables integration within the energy system. This transition could deliver significant cost and environmental savings given new technologies,

Figure 6: Alternative building cooling concepts



business models, enabling policies, human capacity, and investments. This transition can be fuelled by net zero built environments with connected communities. NZ2Cs comprise groups of grid-interactive efficient buildings with diverse, flexible end use equipment, and distributed energy resources that collectively work to maximise building, community, and grid efficiency to meet net-

zero goals, and occupants' comfort and needs. In this way, interactive efficient buildings can build demand flexibility and resilient power infrastructure can be incorporated.

NZ2Cs can provide foundational opportunities for clean energy policy and technology innovation. This is through building-to-grid community scale integration with cost-effective distributed energy resources to harness demand flexibility while providing equitable, reliable energy access. NZ2Cs can help decarbonise, through

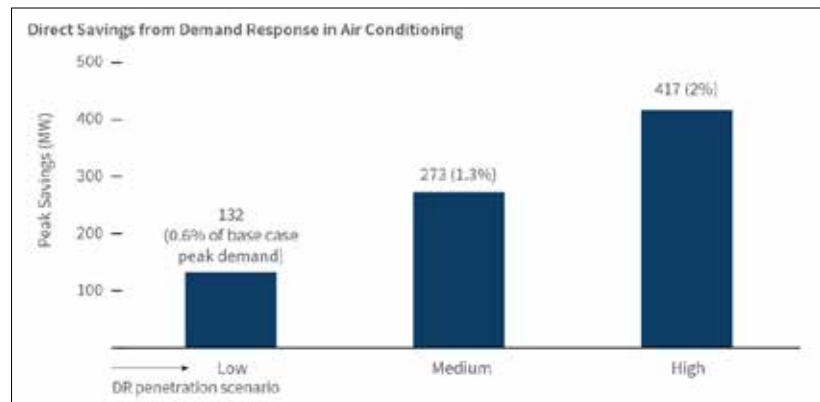
energy efficiency, clean renewables, energy storage and EV charging for the transformation towards climate action and energy security, digitalise, through connecting equipment, buildings, EVs, and energy systems with people and organisations, and democratise, through empowering human capacity, inclusive innovation, and equitable community

participation through green jobs and commercial opportunities.

Studies suggest that load reduction of residential cooling loads for Haryana (modelled for 2030) shows a potential to reduce up to 400 MW (2% of annual demand) of peak load requirements of the state, allowing up to INR 83 lacs per demand response event in power purchase savings (Figure 7). (RMI, 2022). It identifies existing barriers for the successful implementation of grid connected communities, the most pronounced being the lack of understanding of consumer behaviour and granular data availability on critical/non-critical loads.

The U.S Grid-Interactive Building National Roadmap developed by the U.S. Department of Energy's Building Technology Office (BTO) can be an effective precedent for a similar roadmap for India. The roadmap identifies the most important barriers and outlines the key opportunities for full implementation of grid-integrated efficient buildings and associated demand flexibility. It underscores the policy and technology needs of integrating systems, infrastructures, and digital communications and the extent to which NZ2Cs can harness economies of scale

Figure 7: Direct Savings from Demand Response in Air Conditioning in Haryana, India (RMI, 2022)



and leverage diversity of loads at the community scale. It focuses on how to realise the potential benefits of cost-effectiveness, optimised supply chains, energy efficiency, flexible load management, peak electricity demand and energy cost reduction, as well as the critical economic, environmental, and social impacts of innovation, energy resilience, and energy access for all.

It is important to identify various barriers that exist at each point in the value chain in India. Technologies must be developed, deployed, adopted, and utilised before their benefits can be realised. This is a space that is prime for research and development in India; it will require due diligence into the grid systems, expert interviews, surveys, and workshops across key decision makers and stakeholders.

## CONCLUSION

India's energy choices will matter and have a direct and far-reaching impact on the lives of its growing population and major indirect impacts on the rest of the world. Through this paper we have discussed the low carbon-pathway scenarios for India's commercial and residential building sectors and also drawn upon approaches in the United States.

As next steps, embodied carbon is critical given the new construction growth; and it is essential to analyse the technological approaches including reduction in resource use and waste, green steel and cement manufacturing, and integrating accessible and affordable low-carbon materials, building assemblies and circular material and energy flows. To address operational carbon, the use



of passive design methods to reduce active energy demand for space cooling, lighting, and appliances is essential. The goal would be to target an annual energy use intensity (EUI) of <50kWh/m<sup>2</sup> (up to 66% reduction in energy use from baseline through energy efficiency) and only following that, to recommend decarbonized renewable energy to address the remaining 33% energy use in order to achieve net zero building operations. This would be done by assessing the techno-economic feasibility; environmental and economic impact; digital infrastructure requirements; and policy/regulatory support required for deep decarbonization of buildings and the biggest end-use, space cooling. A feasibility study for advanced cooling, and net zero connected communities in India is recommended to capture stakeholder use cases and synthesise the benefits of these approaches to harness the three drivers: decarbonize, democratise, and digitalise. It is also recommended to leverage the economies of scale, diversity of building typologies, and capacity for renewables at the community scale to address the top barriers to overcome barriers to NZ2C scaling.

No building is an island, and

action on a community scale is where the potential benefits of decarbonising the built environment are accrued. Picture a whole campus or neighbourhood full of energy-efficient homes, offices, shops, and other buildings, each with smart appliances and all powered by on-site renewable generation providing energy resilience and wellness. Electric vehicle charging stations and energy storage abound, and all the buildings are knit together by a community smart grid with digital interconnections. This will enable a blueprint for Indian policymakers to start including this into the regional and city master plans and integrate climate net zero connected community framework at a rapid pace to help reduce the emissions intensity by 45% by 2030 and achieve India's net zero goal before 2070.

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## INDIA AND THE G20

India has been an active member of the G20 since its inception. India has also been working to ensure that the developmental issues receive a major focus on the G20. India has taken over the presidency of the G20s in December 2022 from Indonesia and will hold the post for one year. Various events are being held in this connection across the country, and will culminate in hosting of the leaders' summit for the first time in the

country's history in 2023.

The presidency of the G20 offers a unique opportunity for India to push through its developmental agenda, and support the cause of the developing economies. Interestingly, this year the troika comprises of Indonesia (past chair), India (present chair) and Brazil (future chair), all developing economies.

# INDIA'S G20 LEADERSHIP AND SUSTAINABLE HABITAT

**A.K. JAIN**

*“The cornerstone of making a city resilient and low carbon is to adopt a circular lifecycle approach. It entails an integrated approach towards the nature (climate, greens and low carbon), the people (socio-economic, circular economy, culture, education, health, mobility, community participation) and fourth industrial revolution (digital planning, smart, intelligent and interconnected processes, SCADA, block chain, discreet optimisation, algorithm, AI, big data, etc.”.*

**Key Words:** G20, Sustainable Development, Climate Change, Circular economy, AI

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*G20 India Presidency offers a unique opportunity to share the rich experience of India in the habitat sector, and to learn from the member countries. The paper addresses the Urban 20 issues and approaches for climate sensitive and sustainable habitat planning.*

## INTRODUCTION

In 2030, India is expected to be the most populated country, with over 1.5 billion inhabitants, over a sixth of world's population. India will have the world's largest workforce and the world's third largest economy. The ongoing process of urbanisation is vital for economic growth, as 70% of new jobs will be created in cities, putting pressure on infrastructure and the environment. The cities in India are facing the challenges of pollution, water and energy shortages, jobs, climate change, transportation, and utilities. Climate change has become an imminent reality with a rise in global temperatures, changes in rainfall, floods, droughts and intense heat waves. The increasing emissions, heat, fossil fuel usage for transportation and electricity,

and urbanisation are affecting the micro-climate and human health.

India is the third largest emitter of CO<sub>2</sub>, of which 73% comes from energy sector and 63% from electricity generated from fossil fuels. India is also vulnerable to natural disasters, floods and about 33% of its land is affected by desertification or degradation. This needs a renewed focus on human wellbeing, secure jobs, infrastructure and conservation of environment for a sustainable and integrated development.

In response to a 2022 Report on the climate crisis, compiled by 270 researchers from 67 countries, Antonio Guterres, UN Secretary General stated that the Report is 'an atlas of human suffering and a damning indictment of failed climate leadership. With fact upon fact, it reveals how people and planet are getting clobbered by climate change'. The UN 2019 Global Status Report for Building and Construction Sector states that these sectors account for 36% of energy use and 39% of carbon dioxide (CO<sub>2</sub>) emissions, 11% of

which is from manufacturing building materials. Currently, 90% of India's workforce belong to the informal sector, contributing more than half of its GDP. However, informality is leading to precarious jobs, health, education and food security issues. In this context, the only way out is the engagement of urban sector with the Sustainable Development Goals, and adopting an integrated approach towards the well-being, infrastructure and environment.

The United Nations Conference of the Parties (CoP 2021 and 2022) has committed to limit global warming to 1.5 degree Celsius by the year 2100. This necessitates reducing the use of fossil fuels by replacing them with new sources, such as solar PV, green hydrogen, green metals, carbon capture, solid state batteries, electric vehicles, ethanol blended fuels, heat pumps and electric and hydrogen powered transport. This transition can synergise partnerships and exchange of innovative technologies among G-20 countries. India is at a unique position for cooperation at global level and has partnered with the EU, Germany and several other countries. India, in its G-20 leadership role, has been working on Urban -20, which is based on the three pillars:

- Cooperation and dialogue;
- Policy, technology and institutional reforms; and
- Partnership among public and private sector, civil society and academia.

Some of the initiatives undertaken include the following:

- SUNDAR India (Sustainable Urban Network for Dynamic and Resilient India);
- Net Zero Green Growth, Decarbonisation;
- LiFE (Lifestyle for Environment);
- Strategic partnership for the implementation of the Paris Agreement;
- International Solar Alliance;
- Establishing Climate Centre for Cities;
- Institutionalisation of Capacities on Climate Change;
- Solutions for a circular economy;
- Sustainable, Circular systems for solid waste management;
- Enabling Gender Responsive and Universal Urban

Mobility;

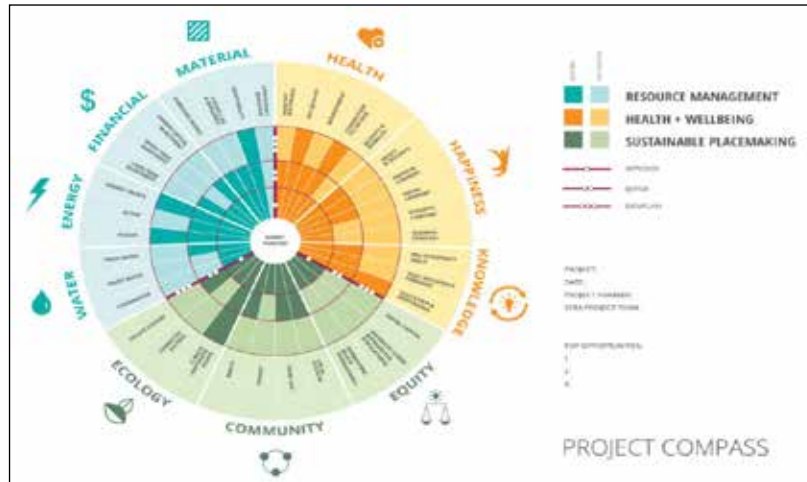
- India Urban Data Exchange, National Urban Learning Platform, Smart Code, National Urban Development Mission, GIS based Property Records and Transaction;
- Infrastructure and recycling platform for plastic waste and e-waste;
- Global initiative on disaster risk management;
- Model Eco- Villages;
- Saptrishi Priorities for Green Growth;
- Sustainable Procurement and Lifestyle Analysis; and
- PM Gati Shakti Master Plan for infrastructure projects.

### **TOWARDS CLIMATE SENSITIVE DESIGN APPROACH**

A climate-sensitive design approach (CSDA) recognizes that the design of a built-up area directly influences the climatic comfort in an urban environment. Green urban planning combines climate sensitive solutions and adaptation strategies in the context of the SDGs, national and local policies. green and integrated urban planning.



Fig. 1: Sustainable Project Compass Developed by SERA, Architects Converges Health, Happiness, Knowledge, Equity, Community, Ecology, Water, Energy, Financial and Material aspects in its Planning (Portland, Oregon)



Source: Kathrine Logan (2022) *The Conversation*, *Architectural Record*, April

For a scientific analysis of carbon emissions and impact on climate change, a climate compass can be developed for the urban processes-ecology, resources, health and wellbeing and place making (Fig. 1). It predicts the impact of various urban projects on the environment and climate. There is a need to establish dedicated climate centres for cities (Fig. 2). Technology, Artificial Intelligence, Inclusive and Deep Learning can help in this task (Fig. 3).

In this digital age, it is necessary that land use-based Master Planning is replaced by five-year horizon local area plans, while their vision may extend to 20 years, which integrate the ecology, built environment, service network, transport

and heritage. These plans manifest innovative concepts of sustainable and circular economy, low carbon energy, climate resilience and circular

Fig. 2: The Climate Centre for Cities



Source: NIUA (2022) *Climate Centre for Cities*, New Delhi

systems of construction, greens, water and waste management.

Climate sensitive design approach covers the following (Fig.3):

- Energy and Green Building;
- Water Resources and Waste Management;
- Mobility and Improved Water Quality;
- Urban planning, Green Cover and Biodiversity;
- Basic Amenities; and
- Good Governance

The cornerstone of making a city resilient and low carbon is to adopt a circular lifecycle approach. It entails an integrated approach towards the nature (climate, greens and low carbon), the people (socio-economic, circular economy, culture, education, health, mobility, community participation) and fourth industrial revolution (digital planning, smart, intelligent and interconnected processes, SCADA, block chain, discreet optimisation, algorithm, AI, big data, etc.).

## URBAN INFORMATICS FOR URBAN PLANNING AND INFRASTRUCTURE SERVICES

The breakthrough in digital technology and informatics

Fig. 3: Climate Resilient Habitat Design Approach



Source: GIZ (2022) *Leaving Green Footprints Behind*, [www.giz.de](http://www.giz.de)

has multiplied space, energy and time. It is time that new forms of energy, services, construction and recycling are evolved, characterized by online exchange of information, interactions, dynamic networks and floating nodes. Integration of land use, utilities, transport and building on a common network helps optimize space efficiency use and space configurations, eliminating unused or under performing space. Utilities need ways to optimize the resources and equipment while minimizing “windshield time”.

Sector-focused, cluster-based intelligent city strategies can set in motion innovation mechanisms and enhance sustainability. The ICT can help in the integration of citizen participation, governance and online consultation over plans and programmes of local development. The urban processes need to be compatible to circular economy by adoption of new technologies, such as digital block chain, combinatorial and discrete optimisation, algorithms, complexity theory, artificial intelligence, big data, and the ubiquitous cloud.

For a transition towards a green and clean economy, smart, resilient, and low carbon infrastructure services, transport and governance, the GIS, SDI, big data analytics, ERP solutions, digital dashboard, block chain, AI, ML DL, etc. have become essential. These have already infiltrated the planning, design, engineering and architectural offices, changing the processes and practices. Parametricism, 3D printing, AI and Realtime Simulations and allow dynamic, real-time interactions with the line departments, stakeholders, and the users. AI also provides an urban performance and evaluation toolbox, giving real-time feedback and simulations. It enables classification, sorting, filtering, strategic search and the exploration of various options and solutions through intuiting algorithmic, and image-based modalities.

### GREEN AND RESILIENT BUILDINGS, HOUSING AND AMENITIES

A low carbon and green building is resilient, sustainable and net zero. It is a synergy between various components such as energy, water, materials, wastes, land, indoor environment, etc. The heating, lighting, cooling, ventilation, and powering of buildings are responsible

for approximately 40% of the total energy use. As buildings are the largest energy users, incorporating energy storage into them will increase the resilience of the total energy distribution network and enable widespread use of renewable energy.

By passive design and low embodied materials, the buildings can be more climatically comfortable. Such materials include carbon-negative cements, low carbon steel, fibre, gypsum, basalt, fibre composite bars, bamboo, etc. Prefabricated and pre-engineered systems contribute to lower the carbon emissions, dust, time and costs in construction (Fig. 4).

The Technology Sub-Mission under the Pradhan Mantri Awas Yojana (PMAY), one of the world's largest housing program, has pioneered new technologies for housing and slum rehabilitation by a partnership approach. Up to 40% of bonus built-up area for market sale makes the projects self-financing, cross subsidising the poor. Similar bundling strategies have been adopted for financing the large infrastructure projects like airports, railway stations, bus terminals, highways, etc. Such approaches can be the models for G-20 countries.

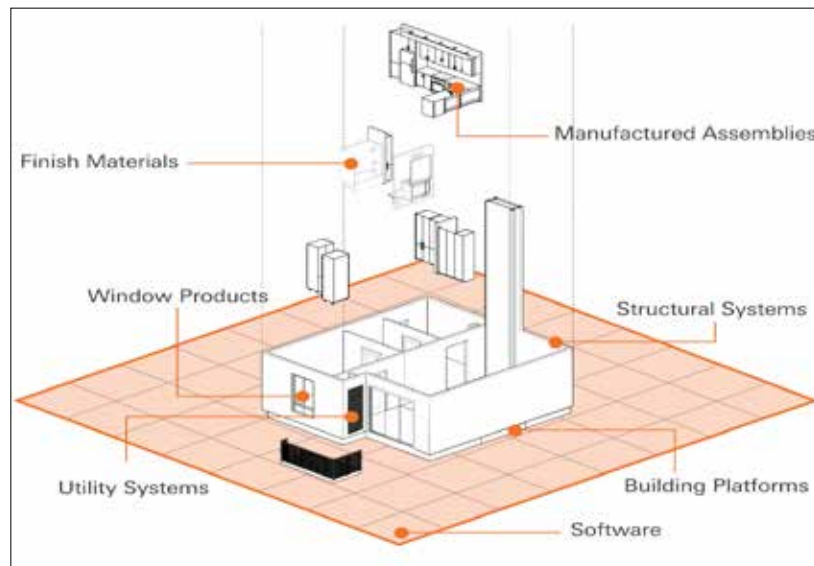
Building Information Modelling (BIM) can simulate the entire construction sequence beforehand

addressing sustainability issues and reducing carbon emissions. Computer-Aided Manufacturing (CAM) and Computer Integrated Manufacturing (CIM) are useful in reducing emissions, dust and GH gases. The simulation of construction process enables better control of time, machine, expenditure and the manpower, and could reduce carbon emissions, costs and time by half to one-third.

After the corona pandemic, the trend is shifting towards healthy spaces and work from home (WFH). This emphasises upon open office, biophilic design with natural light, greenery, atrium and courtyards, which help in better indoor air quality. The building must conform to accessibility standards for people with disabilities.

Form based codes have been recommended by the MoHUA (2019) and IRSDC (2021), which are based on urban design approach that addresses the specific location of the site, such as Transit Oriented Development Zone or heritage zone, infrastructure potential and the volumetric development of the properties. Accordingly, a regulatory plan comprising the building envelope, public space, building services and environmental norms is developed.

Fig. 4: End-to-end control of building design, manufacturing, construction, and operations achieve targets at lower cost and time



Source: Kattera, Key Assemblies, and Curtis, Craig (2020) *Architecture at Scale: Reimagining One-Off Projects as Building Platforms*, Architectural Design



## URBAN HEAT MITIGATION AND CLIMATE RESILIENCE

In a dense built-up area, the hot air dome, i.e. heat island, affects the microclimate. There are irregular rains, dry spells or flash floods. The greenery and open space in windward direction and cooler surface materials (roads, parking, buildings, roofs, etc.) help in mitigating the effects of climate change and urban heat island. This needs preparation of a city-wide Heat Mitigation Plan and mandatory use of heat reflective and permeable materials for rooftops, pavements and roads. Insulation, white paint, cavity walls, water fountains, vegetation and cross ventilation can also mitigate the urban heat.

## AIR QUALITY

Air quality data is significant to gaining a thorough understanding of local air pollution. Recent technological advancements have made it possible to gather data, with low-cost monitoring devices and advanced methods of collating and analysing it. This helps to gain an understanding of pollution levels, their causes and effect. Now-a-days, smart electricity poles with sensors are available to monitor pollution parameters along with light, CCTV, Wi-Fi, etc.

The New Delhi Municipal Council (NDMC) has been using these in New Delhi. Google plans to map street by street air pollution, and the active sensors will measure CO<sub>2</sub>, CO, NO<sub>x</sub>, NO<sub>2</sub>, ozone and particulate matter. The data can be used to analyse the issues, sources and project various options and actively schedule to assign the responsibilities, project management, including timelines and monitoring. Air shed planning, use of cooler and light shaded surfaces/materials, prefabricated and recycled materials, including construction and demolition wastes in construction and repair of roads and buildings, can help in reducing urban heat, air pollution and dust.

## GREEN ENERGY

According to the Economic Survey (GOI 2023) by the year 2029-30, of the total installed energy capacity of 800 GW, 500 GW would be from non-fossil fuel sources, resulting in decline of 29% of carbon emissions. India aims to achieve net-zero emission by 2070 that needs shifting from fossil fuel to electric vehicles, green hydrogen, biofuels, etc. Low carbon energy would be derived from renewable sources, such as biofuels, wind, tidal and solar power.

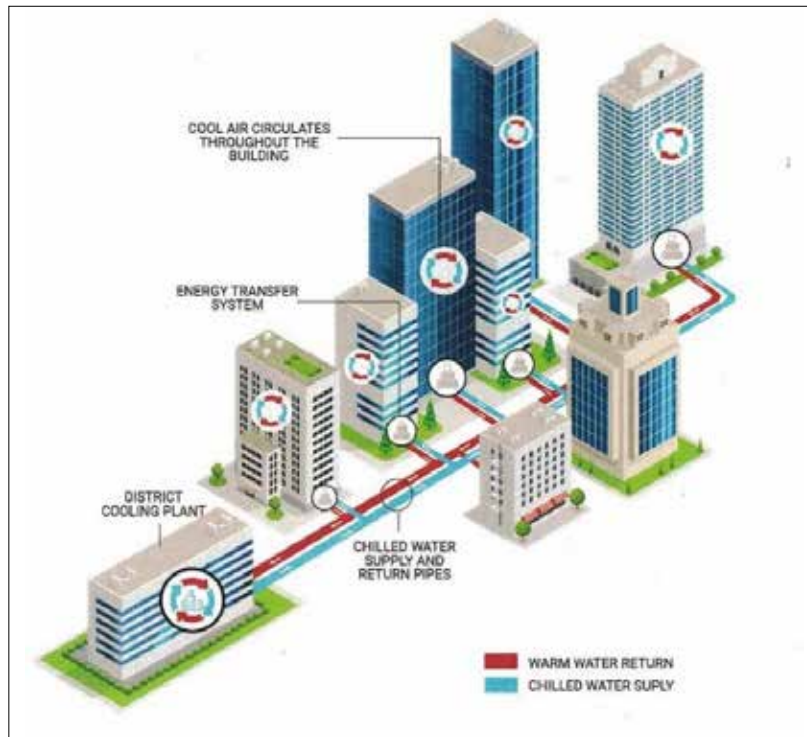
The concept of energy efficiency, renewable energy and Zero-fossil Energy

Development (ZED) can reduce the energy demand and consequential pollution. Smart Micro-Grids, Distributed Energy Systems (DES), Micro-Districts and Anchor Micro grids should be linked with renewable energy network and energy efficiency. A series of low carbon zones across the city with co-located tri-generation energy systems (combining power, cooling and heating), can lead to 'green energy'.

The energy guzzling air-conditioning can be avoided by innovative methods like Net Zero Energy Design, variable refrigerant volume (VRV) system, earth air tunnel (EAT), thermal storage and Passive Evaporative Draught Cooling (PEDC) systems. District cooling is an efficient option to air-condition a cluster of buildings (Fig. 5). Lower ambient lighting with bionic controls and integration of natural light with high performance glazing combined with light sensors can save energy use in a building. Synchronized lighting control systems can be designed to match building loads and schedules, which are segmented into multiple zones to allow intelligent controllability. The Energy Conservation Building Code (2017) provides the guidance for low carbon, energy efficient building design.



Fig. 5: Energy Efficient District Cooling



Source: [www.giz.de/el](http://www.giz.de/el)

## WATER CONSERVATION AND MANAGEMENT

With increasing river pollution, building over wetlands and drying of water bodies, several cities in India have become water stressed. Only 18% of the renewable water resource is being recycled, and only 10% of the annual rainfall is being harvested in India. To overcome these problems, water sources need to be planned and managed as circular systems. The water bodies, wetlands and the rivers need to be protected by sanitation/sewage interception, and by recycling and treatment of wastewater.

Zero run-off drainage with the provision of swales, retention ponds, etc. can optimize retention of rainwater locally. Besides these measures, water efficient taps/fittings, dual plumbing, recycling of wastewater by DEWATS and adoption of new technologies, such as Block chain and SCADA systems, can help in a more efficient water supply.

## LOCAL FOOD PRODUCTION

The urban farming can be integrated as part of green urban planning (GUP). The system is based on different waste and resource flows in agriculture and food production, focusing on waste

exchange, recycling, energy efficiency, and innovative technology.

A city should be able to grow its own food and minimize its footprint. This is possible by vertical farms, rooftop, and household agriculture and by using wastewater for irrigation. Satellite controlled park and lawn micro-irrigation system cuts water consumption and pumping power. Wastewater recycling, with dual piping would reduce water demand. Vertical farms could reduce fertilizer and freshwater use, shorten transport and recycle grey water otherwise dumped by treatment plants. Collecting rainwater and growing food locally in urban areas can respond to the challenges of transport, urban-rural divide,

Fig. 6: Retrofitted Shipping Containers used for creating multi-storied urban farms-cum-apartments in Seattle's Proposed Centre for Urban Agriculture (Mithun Architects)



Source: Azure, September 2008

biodiversity, social equity, waste minimization, and energy (Fig 6).

### GREEN INFRASTRUCTURE AND INTELLIGENT UTILITIES

Green infrastructure has an important role to play in the adaptation and mitigation of climate change. Such infrastructure is adopted to build thermally comfortable outdoor spaces, improve aesthetics, and increase the water conservation by reducing surface runoff, increasing infiltration, and improving urban drainage management. It also includes green/public spaces, bio retention cells, and landscaped depressions that capture and infiltrate storm water, green roofs and wetlands.

Surveys reveal that approximately 40% of urban population in India is not covered by sewerage, sanitation, drainage and solid waste disposal. Various alternative technologies, based on the use of IT, simulation, block chain and automation can make the services smart and intelligent. The common method of land filling for solid waste disposal is an environmental disaster. Instead, decentralized systems based on 5 R strategy of reduce, refuse, reuse, recovery and recycling should be explored. Three bins provide separate bins for trash, recyclables and

compost. Biotechnology, enzyme based STP, bio-remedial treatment, vessel system, sludge gas/energy recovery, vermi-culture, fossilization and composting options can be adopted for solid and liquid waste management. Underground pneumatic conveying systems are more hygienic, economical and avoid movement of trucks for transportation of wastes.

### CLEAN TRANSPORT AND TRANSIT ORIENTED DEVELOPMENT

As urban transport contributes nearly two-thirds of the total suspended particulate matter and 18 per cent of carbon emissions, it is necessary to provide sustainable modes of transit run by alternative fuels, like electric batteries, green hydrogen, ethanol blended gasoline, etc. Integrated Transit Corridors (ITC), integrating BRT, Metro, and trains, together with pedestrian and cycle lanes, can be flanked by high-density developments. In existing cities, the 15 minutes Paris model, can be adapted, which means maximum 15 km distance by metro/trams, 8 to 10 km by bus/car/2 wheelers, 2 km by cycle and 1 km by walk.

Existing roads can be revamped and landscaped to enhance space for pedestrians, cyclists and public transit systems. All highways and

railway/metro lines should provide safe crossings for pedestrians, wheelchairs, prams and animals. Multi-modal integration, last mile connectivity and e-governance are the pillars of sustainable urban mobility. The inverted pyramid of green transportation indicates linkages, cycling and public transport need to be given priority over private cars. Compact development can optimise urban footprint and need to travel. A better dispersal of traffic can be achieved by a finer grid of roads with a maximum spacing of 250 m roads and 100 m for NMTs/pedestrians.

### ENHANCING SOFT MOBILITY

The walkability network analysis is based on two key indicators:

- i Service catchment area calculates the total length of sidewalk necessary to reach the dwellings, shops, and workplaces from the bus stop/metro station at 100, 200 and 400 meters; and
- ii Urban permeability indicator calculates the average perimeter of an urban block by weighing its impact on pedestrians' movement.

These requires the following:

- Consolidated public green, which is

universally accessible, rather than strips of setbacks (Fig. 7);

- Connect pedestrian spaces with tree arcades, awnings, or canopies;
- Provide green infrastructure (swale or infiltration areas) in open areas and along the roads;
- Plan shelters at 5-minute walk at distances of 100–150 meters;
- Design transit priority areas and wide sidewalks to provide barrier-free areas for pedestrians; and
- Reduce wind speed by planting shading, deciduous trees.

It is necessary to digitise all the parking spaces including under stilts, multi-level structures, on roofs and underground spaces. Seamless multimodal public transport system would work better by adoption of single ticketing and restructuring of land uses by transit-oriented development. Digital parking meters tell mobile phone when a space opens, reducing traffic caused by drivers trolling for parking.

## AN INTELLIGENT COMMUNITY NETWORK

An intelligent geo-portal can bring together various

Fig 7: Consolidated public green, which is universally accessible, is more functional rather than strips of setbacks.



Source: IRSDC (2021) Codes for Commercial Development on Railway Land, New Delhi

line departments and communities on a platform for e-service delivery. The system is mobile and internet based and is dynamically scalable. It helps in technology enabled management of land, infrastructure, planning and development for better co-ordination, cost and time management.

Smart chips can be embedded almost in every urban service, such as smart street poles, which collect air pollution data, provide internet, CCTV with the facility of an emergency call. With digital chips getting embedded in a city's epidermal and exoskeletal level and its connective tissues, cities are increasingly getting digitally scripted and coded. Information technology

can be used to provide services to enhance users experience, such as high-speed communication and data management, carbon-emission accounting and performance objectives. This implies integration of green concepts with smart, ICT based technology to optimise their performance, monitoring and maintenance.

## CONCLUSION

India's G20 Presidency offers an opportunity to realise the theme of *Vasundhava Kutumbakam*- One Earth, One Family, One Future and make the human settlements inclusive, resilient and sustainable. This needs working out innovative and comprehensive measures to improve the built environment, livelihoods,



urban governance and structural transformation propelling green growth, prosperity and equity. The concepts of Sustainable Urban Networks for Dynamic and Resilient (SUNDAR) and Lifestyles for Environment (LiFE) can be adapted and extended to all the G-20 countries.

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# TOWARDS A NEW “INDIA URBANISATION POLICY-2023”

**PROF. N  
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*The paper highlights the need for a new urbanization policy 2023 in the context of India’s urban development; and outlines its possible components. The paper lays out a vision for the new urbanization policy – from policy, planning to its implementation mechanism.*

of activities, exchange, and movement, emit high volume of carbon, they are critical in fulfilling the commitment.

India is experiencing demographic transformation from predominantly rural to predominantly urban. India’s urbanization is described in many ways: rapid, massive and even reluctant. Rational Planning, Development, Operation and Management (PDOM) of urban areas call for concerted attention and action. Unfortunately, the pyramid of Urban PDOM is inverted: very little planning, slightly better Development, struggle with Operation and exhaustive Management. Each succeeding layer needs to tackle the residual problems left by the previous layer before attending to its own sphere of action. The result is the exasperating and frustrating failures of management measures to resolve the issues. The pyramid needs to be inverted and made to stand on a broad base of Planning tapering gently to its apex.

## INTRODUCTION

India has Resolved and Committed- resolved to be developed by 2047; and committed to Net Zero Carbon Emission by 2070. Both are critical and arduous. It is now the duty and responsibility of all stakeholders– Governments, Industry, Academia, Service Providers and above all the People to organise their thoughts and actions towards fulfilment of the above resolve and commitment. As urban areas are centres of production and consumption of Goods and Services; generators of Economic Momentum; and contribute a large share of the National GDP, they are key to achieve there solution. As urban areas, as centres

*“It is prudent and important to formulate, enunciate and implement a comprehensive new urbanisation policy to guide, direct and facilitate urbanization and urban growth to contribute to national goals and objectives. The new India Urbanisation Policy-2023 (IUP-2023) needs to be multi-dimensional.”*

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## INDIA URBANISATION: SHARE AND SIZE

World population has reached 8 billion. The first billion was reached in 1820 after millenniums of human existence. The eighth billion happened in only 12 years. The global population is expected to reach 10 billion by 2050. India has a major share of world population. At 1.3 billion, it accounts for 16% of world population. Estimates indicate that it would be about 1.6 billion by 2050. Some recent studies indicate that there is a decline in population growth and it would be about one billion.

The urban population is fast growing and is about 0.4 billion at present. It is estimated to be 0.8 billion, a share of 50%, by 2050. While doubling of urban population in three decades is massive, still, to achieve developed status and be a \$30 trillion economy, it is imperative that the urbanisation process is accelerated to achieve share of 80% by 2050. It is a stupendous, but necessary task.

## INDIA URBANISATION POLICY (1988)

There was great euphoria and high expectations when the National Urbanisation Policy (NUP) was enunciated

in 1988. Consequently, many urban development schemes were initiated indifferent Five-Year Plans, the current one being the National Smart Cities Mission. Large sums of money have been invested. However, the outcomes have been disappointing. Urban problems and issues continue to be critical. Attention gets limited to project management. Policy and Planning get neglected.

The NUP 1988 is aged. There have been drastic changes in all spheres of development. New challenges have arisen and there are new opportunities. It is prudent and important to formulate, enunciate and implement a comprehensive new urbanisation policy to guide, direct and facilitate urbanization and urban growth to contribute to national goals and objectives. The new India Urbanisation Policy-2023 (IUP-2023) needs to be multi-dimensional. The main components of IU Pedis cussed in the following sections.

## NEW INDIA URBANISATION POLICY (2023)

### Revise Urban Definition

The present definition of "Urban Settlement" in India is complex (Census Towns). It combines aspects of demography, spatial and

economics (with a gender bias thrown in). In addition, there are "Notified" urban centres. It is interesting to note that there are more 'notified urban centres' than "census towns." Presently', there are only about 8000 urban settlements as against more than six lakh rural settlements. Many countries consider settlements with 2000/5000 people as Urban. If 5000 size is considered, then another about 24,000 settlements get defined as urban. That would add about 150 million people to urban category, taking the urban share to nearly 50%.

The NUP to define a human settlement, with 5000 or more people, as urban.

### Promote accelerated Urbanisation

It is estimated that by 2050, India's population would be about 1600 million with 50% urban. Though the addition of urban population is massive, still to achieve developed status and be a \$ 30 trillion economies, it is imperative that the urbanisation process is accelerated.

The policy objective needs to be to achieve 80% urban by 2050. It is a stupendous task but a necessary one.

### Promote Directed Urbanisation

While aiming at "Accelerated

Urbanisation," it is equally important to promote "Directed Urbanisation" in terms of many small and medium size towns. Growth of metropolitan cities, both in number and size, needs to be discouraged. Aggregation and concentration of people and activities are no more necessary or relevant. Planning and development of Provision of Urban Facilities in Rural Areas (PURA) offer an opportunity in this direction.

PURA, conceptualised by Prof. Indiresan and vigorously promoted by the then President of India, Dr. Abdul Kalam, was completely misunderstood and misinterpreted as rural development by the field implementers. The national objective is to double the income of farmers. To do this, some have opined that it is necessary to move half the rural population out of their villages into urban centres. This is a complex task with many negative impacts. PURA provides an alternative strategy. It envisages movement of secondary and tertiary activities into rural areas to provide economic opportunities to the surplus rural labour at the village itself. Instead of demographic shift, it is occupational transformation.

The establishment of PURA would include: 1) Grouping of several adjoining villages to contain a population of a few thousand; 2) Connecting the villages in the group with each other by a circular road; 3) Operation of transport service along the interlinking road; 4) Location of secondary and tertiary sector activities in the villages with distribution of the different types of activities in different villages. People from each village would be moving to all other villages to avail of the urban facility. This would promote social cohesion amongst the villagers. Over a period, the PURA would obtain some characteristics of an urban area, while retaining rural activities. PURA heralds the change in the direction of urbanisation. The change will be the shift away from big cities to small cellular communities. The change is from RURBAN (rural to urban) to CiVILLAGE, a term coined by Kakodkar (city to village).

#### **Promote Corridor Pattern of Urbanisation**

The urbanisation pattern needs to change from "Cluster Pattern" to one of "Corridor Pattern" all along the transport network system. The extensive road and rail network systems

under development, coupled with digital technology, offer a unique opportunity for corridor pattern of urbanisation.

#### **Promote Balanced Urbanisation Pattern**

The pattern of urbanisation by states/regions, is highly skewed. States like Maharashtra, Punjab, Tamil Nadu are comparatively highly urbanised while some like Odisha, Bihar, Uttar Pradesh are low in urbanisation. The comparative economic status is correlated to urbanisation level. The policy is to accelerate the urbanisation of all the states. The objective to be that no state has less than 50% urbanisation.

One important factor promoting urbanisation is the degree of accessibility and connectivity. Presently, India has a major programme of intense development of transport and communication system in terms of massive development of road and rail networks and Digital Technology. This, coupled with other programmes, should help in achieving a balanced urbanization pattern.

Accessibility and connectivity are factors enabling urbanisation. India has a major

program of infrastructure development. The present pattern favors the already highly urbanised states. At present, infrastructure development is following demand. The emphasis needs to be changed. The policy is to be that infrastructure leads development. Accelerated development of infrastructure of the low urbanised States needs to be initiated on a priority, to promote higher urbanisation in these States, leading to a more balanced urbanization pattern.

The policy needs to be to promote, enable, and facilitate accelerated, directed, and balanced urbanisation, with a share of 80%, a size of 1200 million (as per new definition) and a pattern of small and medium size towns, with PURAs as a strategy. The number of metropolitan cities is to be limited to 100 by 2070 and their share of urban population is to be not more than 30%.

**Promote, facilitate and ensure preparation of Master Plans for all urban centers.**

Preparation of the first Delhi Master Plan (1981), in 1962, generated high excitement and created great interest in City Master Plans. The 100% financial assistance by the central government for preparation of city master

plans, in the Third Five Year Plan, helped in the preparation of Master Plans for many cities and towns. This was followed by enactment of Town and Country Planning Acts in the States. Several, Planning and Development Authorities were also set up to implement the Master Plans. Since, urban development has received attention and funds through a number of centrally sponsored schemes, the latest being the Smart Cities Mission.

With all the euphoria, it is a matter of surprise and concern that, as of date, many towns do not have a Master Plan. City Master Plan (CMP) is an indicator of goals and objectives. It is a means of resource mobilisation, particularly land. It is a guide and moderator of urban form and structure. It is a creator of institutions. It is also an integrator and coordinator of inter-sectorial policies and programmes. It is an advocate of the interests of the city. CMPs are more concerned with outcomes than outputs. CMPs are defined as dynamic. Unfortunately, they have mostly remained static. Zonal Plans and Local Area Plans are mostly absent. The Master Plans are supposed to be facilitators of growth and development of the city. But they have turned out to

be more regulators, usurping the power of the Local Authorities.

**Promote Low Density—Low Rise Urban Form**

Delhi Master Plan 2041 has envisaged to contain a population of 30 million over an extent of 1485 sq. km, the area of Delhi UT. Of this area, about 20% is not developable. That means a gross density of 25000 ppsq. km. This translates into a net residential density of about 100,000/ 125,000 ppsq.km. This is excruciatingly high with many negative impacts.

It is prudent to adopt a maximum gross density of 5000 ppsq.km. This would mean 8% to 10% of the country's land under urban use for an urban population of 1200 million as per new definition, against the present consumption of about 5%.

Density, defined as persons per unit area (saysqkm), is an important index of urban planning and development. It determines the area of land to be brought under development over the planning period. It shapes the urban form and enables urban structure. It moulds urban social cohesion and promotes urban economy. It decides resource consumption and selects technology. It affects



the health of the people for good or bad. In sum, it determines the “Quality of Life” in the urban centre. As Indian cities grow low but steady, aggregation and urban extent do not increase concurrently. Urban density increases and over a period touches in criminalizing levels. There is a great variation amongst different parts of the city with the traditional core area suffering from acutely high densities.

With high densities, land for other urban activities becomes scarce and costly. The availability also shrinks. This adversely affects the provision of public utilities and services. This leads to lop sided development and cost escalation. Economics determines urban development at the cost of other components: social, health and environment.

### **Build Loigisticropolises (New Towns)**

Since independence, India has built several New Towns. Most of notified (non-census) towns are in fact new towns. The functions of these new towns vary widely. They include: Administration, Industry, Knowledge, Defence, Health, Sports, Trade and Commerce, Transport and Religious. Except for Chandigarh and to a little extent, Auroville,

the experience of planning, development, operation, and management of New Towns has not been assiduously recorded. The thrill of conception and planning, the zeal of development, the difficulties of mobilizing cores, the frustrations of co-ordination, the innovation in institutional frame work and the joy of seeing the birth of the new town have all been lost to posterity.

### **Experience lost; lessons for gotten.**

The National Logistics Policy offers great opportunity in building about 100 New Towns all over the country that may be called as Loigisticropolises. The present 54 and the additional 46 metropolitan cities, by 2050, would be the potential hubs envisaged in the NLP. From the present concept of “Hub and Spoke” pattern, they would transform into a “Network System”. Expedience should not override rationality. The Logistics Hubs should not be developed as a part or adjunct of a city, with only container yards linked to the transport heads. They need to be conceptualised and developed as integrated townships, away from, but connected to, the city. These Loigisticropolises need to include, apart from container yards,

extensive and modern Truck Terminals, Rail Terminal and possibly a freight dedicated Airport, service and auxiliary Industrial Areas, residential and other related areas of an self-contained town.

The Loigisticropolises are to be developed to contain a population of 0.1 million to start, with potential to grow into a medium size town of about half a million people, forming the important nodes of the new IUP. They shall be the receptacles of the accelerated urbanisation under the new IUP.

### **Carry Out Institutional Reforms**

Institutions are important to translate, enable, facilitate, and implement action programmes on the ground which the public can perceive, avail and enjoy. In the absence of appropriate institutional framework, policies would remain redundant. While practice without theory is absurd, theory without practice is redundant. The institutional frame work would include: Organisation; Monetary and Fiscal Systems; and Legal.

### **Organisation: Restructure the Organisation System**

Historically urban planning and development has been the domain of Local Government.

For reasons many, they have been neglected or poorly done. Vested interests have thwarted the full implementation of 74<sup>th</sup> Amendment. It is important to rejuvenate the Local Self Governments (LSG) to play their role effectively.

DMP-1981 (1962) introduced the concept of City Development Authority for planning and development of the city. Delhi Development Authority was constituted, supported by seed capital and extensive land, and backed by a statute. While there was an initial euphoria, over time, DDA has tended to be bureaucratic, regulatory and project implementer. Only the formality of revising the Master Plan, once every two decades to legalise things that have happened, has remained.

DDA in turn, had become the model for other cities to emulate. Now almost all major metropolitan cities have a Development Authority. The experience is mixed. With regulatory and project implementation functions predominating, policy, planning, facilitation, coordination, and such other functions have been relegated to the back. The result is urban chaos and disharmony. It is time to take a look. Regulatory function

needs to be divested from Development Authorities (DA) and restored back to LSG. They, in turn, need to be strengthened in terms of resources, capacity, and technology. Development function may be vested with Special Sectorial Agencies/ authorities in case of metropolitan cities. In all other urban centres, it needs to be vested with the LSG.

The City Development Authorities need to be reformed and restructured into City Planning and Management Authorities (CPMA) whose functions would include:

- 1) Policy (inter and intra sectorial);
- 2) Planning (City level: Long range and short term). (Zonal Plans and LAPS to be the responsibility of LSGs);
- 3) Resource Mobilisation;
- 4) Facilitation;
- 5) Co-ordination;
- 6) Information system Management;
- 7) Management of City Development Fund;
- 8) Management of Land Bank;
- 9) Fare Policy on City Multi-

modal Public Transport System;

- 10) Dispute Resolution;
- 11) Research; and
- 12) Advocacy

The CPMA should include full time professional members. The professional members represent the profession and not any organisation. They need to take care of the interest they represent: Planning, Economics, Technologies, Legal and Human resources.

**Resources: Carry out Monetary Reforms—Establish Urban Development Funds at City, State and Central Levels**

Urban development is costly and has long gestation. Large sums of moneys are required at the right time and place. The gestation period of investments is long. Returns are uncertain and risks high. But the show must go on. It is imperative to mobilise capital from all potential sources. Traditional dependence on government budget is inadequate and uncertain. Borrowing is pleasant but is an albatross around the neck. Self-reliance is the best and safe means. The city itself is a source of capital.

Historically, the local bodies are supposed to raise

capital. But the experience is disappointing. The collection is poor as well as the will to collect is weak. Systemic changes are necessary. Local Bodies need to be empowered and held responsible for efficient collection.

The Expert Group on The Commercialization of Infrastructure Projects, Dept. of Economic Affairs, Ministry of Finance, GoI, in its Report titled 'The India Infrastructure Report (1996)' has identified few means of financing urban infrastructure, which include: General Taxes; Special Taxes; User Fees and Charges; Special assessment districts; Exactions and Development Taxes; Pricing; Betterment Levies; Land Readjustment Schemes; Valorisation Charges; Capacity Allocations; Excess Appropriation; Linkage; Build, Operate, Transfer; Infrastructure Development Banks; Development of Domestic Capital Markets; Bond Markets; Packaging Long term Debt for Infrastructure; Debt Market Development through Infrastructure Finance. A determined effort is called for to identify, detail, and collect capital.

It is prudent to establish a "(CITY) DEVELOPMENT FUND" and credit the capital

raised to this fund. The Fund shall be non-lapsable and non-dirigible. To augment CDF, suggest that 0.001% of all city development projects be credited to the CDF. Collection of capital is important but more important is its rational allocation amongst different claimants. It is best that the fund is managed by the CPMA till such time the measures envisaged in 74<sup>th</sup> Amendment is implemented.

The major share of the capital should go to the local authority to discharge their development functions. The Fund needs to be judicially allocated to different projects which are in line with the prescribed policy and plans. In addition to city level UDF, it is prudent to establish State and National level UDFs to fund projects of state and national importance and those which lie in the jurisdiction of one or more urban areas. (As this script was being edited, the Union Finance Minister, in her budget speech, has announced the setup of Urban Infra Fund with an allocation of Rs10,000 crores per year. That is encouraging. But would the term "Infra" constrain flexibility? The amount is too small to matter. It averages just above Rs. One crore per urban centre. No matter. It is a good beginning. The fund can be augmented.

### **Adopt rational pricing of all Public Services**

Municipal Bodies and other Public Service Agencies are obliged to provide public services to the public. The cost of services is high. It is a good principle to charge the user for the service. In recent times, under competitive political fever, governments are racing to provide the services free. All urban services need to be rationally priced and charged.

### **Resources—Land: Establish Land Banks at the City Level**

Land is a critical resource for urban development. Many urban projects are held up, delayed, or dropped for want of land at the right time, right place and in right quantity. Land costs also make many vital projects non-viable. Delhi experiment in the initial years owes much to the large extent of land vested with the DDA. Presently, land is a major constraint for most of the projects. It is important to establish Land Banks at city level. These could be managed by the CPMA. The process of establishing and managing Land Banks needs to be detailed.

### **Adopt and Adapt Modern Technology**

India missed the Industrial Revolution and got pushed in to the lowest level of economic development. In recent past, India has

experienced “Green” and “White” revolutions to great benefit. Presently the world is experiencing “Technology” revolution. It is heartening to note that, India is part of it, if not the lead. Another revolution that will emerge in this decade is the “Education” one.

The combined result of these two will have far reaching impacts on the development of the country. India’s urban centres are crucibles for these two revolutions. No effort should be spared to facilitate, participate, and benefit. The expanding frontiers of digital technology are astounding. Artificial Intelligence and Metaverse are said to revolutionise the way of thinking and acting. It is important that all actions under urban PDOM embrace the latest technology.

Though India has a lead in Information Technology, the access to internet is still only about 60% of the people. It is necessary to achieve full coverage. An intense programme of education and training, especially of the old, needs to be initiated. Adaption of technology in the daily life of the people needs to be aggressively promoted.

#### **Promote Research and Development in Areas of Urban Pdom**

It is a sad fact that research and innovation in the field

of urban PDOM is extremely poor. Many factors inhibit research in India. Primary amongst them, apart from funding, is the indifference, even contempt towards research by all, including professionals. A drastic change in attitude is called for. Confidence in indigenous research for growth of knowledge and leadership needs to be inculcated amongst all. This has been amply demonstrated in other fields like Space Research and Development.

#### **Establish Urban Information System**

Information is power. That is, Information based on real time data, analysed, and presented in an understandable format. A sound Information System (IS) provides a basis for rational policy formulation and effective action programmes. Earlier, there was an effort to establish an Urban Information System by Town and Country Planning Organisation, Ministry of Urban Development, Government of India (GoI). As part of Master Plan studies and Detailed Project Reports, extensive data is collected at high cost. Unfortunately, they remain in the Reports and become obsolete in no time. This is a sad situation. It is important to Design, Develop, Install, Maintain and Disseminate a National

Urban Information System (NUIS) on a systematic basis.

To establish NUIS, comprehensive National Urban Surveys are to be carried out on a regular periodic basis, say every five years, one round of which shall be concurrent with census operation. An earlier effort, as part of National Sample Survey, 32<sup>nd</sup> Round, was not very useful as the sample size, city wise, was too insignificant to be useful.

A dedicated Organisation to be named as India Urban Surveys and Information System Institute (IUS&ISI) needs to be set up to conduct the surveys and maintain the UIS. Like Census, the data and information so collected and compiled should be available to all interested persons for their use, analysis, and interpretation. It may be made mandatory that all data collected as part of any urban planning study, to be compiled in digital format and deposited with the IUS & ISI. The urban surveys shall include all urban sectors.

#### **Advocate Urban Interest**

It is a sad fact that, while everyone is interested in urban affairs, no one is in urban interest. A pessimistic view and escapist attitude prevail. Hardly any systematic effort at advocating the needs and interests of urban areas is made on a consistent and persistent



basis, particularly pre-budget formulation of national and state governments. Also, at times when national and State polices on a variety of subjects are formulated which affect urban interest one way or other.

It is true that reports highlighting urban issues do come out now and then and cause some ripples. But their dissemination and reading are limited to a small circle. Surprisingly most of these reports are from foreign institutions who have their own agenda. The need for advocating urban interest is important, timely, and critical. Academia, media, and NGOs need to take up this responsibility. They need to be facilitated to play this role effectively.

### **Enact Comprehensive Urban Planning and Development Act**

Legal status for any policy, plan and project is important for their implementation. Legal Act defines the purpose, objectives, and procedures. It denotes the authorities and details their functions, powers and procedures. It establishes equality. It provides to reconcile conflicts and resolve disputes. To sum, law is the soul of the policies and plans.

Traditionally, India's urban development and management has been governed by the municipal

laws. In some states like Tamil Nadu and Maharashtra, urban development, mainly development of residential areas, was enabled through town planning schemes under state town planning acts.

Post-independence, with the advent of Master Plans, Town and Country Planning Acts were enacted in all the states. Also, special acts were legislated to setup City Development Authorities.

Over a period, the scope of urban development has expanded and has become complex. The role of all the three levels of governments—Union, State and Local—are overlapping and causing conflicts. Emerging technologies require exclusive powers and procedures. There is a need to relook at the enabling legal provision sand enact comprehensive Urban Planning and Development Acts.

The proposed City Planning and Management Agencies (CPMA), apart from enabling the implementation of urbanisation policy, should provide for enunciation of urban sectorial—Land Use, Housing, Transport, Technology, Energy, Environment –polices and for setting up of sectorial authorities/ agencies for the PDOM of the individual sector, within the overall frame work of the city development plan

and be under the super vision of the CPMA.

To resolve conflict of jurisdiction over urban land, it is prudent to classify “URBAN LAND” as a constitutional function and include the same under concurrent list of the Seventh Schedule of the Constitution.

### **TO SUM UP: IUP 2023 – DIMENSIONS**

- i. Revise urban definition as: “A Human settlement with population 5000 or more”;
- ii. Promote accelerated Urbanisation;
- iii. Direct Urbanisation. Establish PURAs;
- iv. Promote Corridor Pattern of Urbanisation;
- v. Promote Balanced Urbanisation Pattern;
- vi. Promote Facilitate and Ensure Preparation of Master Plans for all urban centres;
- vii. Adopt Low Density-Lowrise Urban Form. Adopt a Maximum Gross Density of 5000ppsq. Km for urban areas;
- viii. Develop 100 Logisticopolises as New Towns;
- ix. Carryout Institutional Reforms;

- x. Organisational
- a. Restructure Organisation System;
- b. Establish CITY Planning and Management Authorities in lieu of CITY Development Authorities;
- c. Implement 74<sup>th</sup> Amendment in full;
- d. Rejuvenate Local Self Governments;
- e. Transfer Urban Development and Regulatory Function to Local Self Governments;
- f. Carryout Monetary and Fiscal Reforms:
  - Mobilise Capital by Innovative Measures;
  - Establish Urban Development Funds a tall Levels: City, State and Centre;
  - Establish Urban Land Banks;
  - Adopt Rational Pricing Policy for all urban services;
  - Tweak Fiscal Laws to Facilitate Urbanisation Policy implementation;
- g. Legal Reforms:
  - Enact Comprehensive Urban Planning and Development Act;
- h. Conduct National Urban Surveys; and
- i. Establish India Urban Information System and Information System Institute (IUS & ISI):
  - Include “Urban Land” in the Concurrent List of the Seventh Schedule of the Constitution;
  - Adopt and Adapt Modern Technologies;
  - Promote Research and Development in areas of urban PDOM;
  - Design. Maintain and Disseminate Urban Information System;
  - Advocate Urban Interest. Associate and facilitate NGOs, Media, and other forums.

### ENABLERS

The present circumstances are highly favorable for the successful implementation of the urbanisation policy and concurrently, urban sectorial policies, strategies and programmes within the frame work of the urbanisation policy. The enablers are: 1) the resolve and commitment of the governments; 2) the political importance of

urban due to the emerging change in demographic balance between rural and urban; 3) the large size of the young, educated, energetic, innovative and aspirational demography; 4) the fast changing digital technology; 5) the adoption of AI, Metaverse and other modern technologies; 5) the concept of WfH/WfA, which has made the conventional office redundant and the spatial concentration of activities and workers irrelevant; 6) the development of high quality and extensive transport network systems; 7) the detriment of climate change and the force of sustainable development; and so on.

Time is opportune to decide and act.

### A CAVEAT

Urbanisation and Urban Policy leading to Urban Master Plans provide a frame work for enunciation of urban sectorial policies viz: Land, Housing, Transport, Industry, Physical and Social Infrastructure, Environment, Technology etc. Detailing and implementation of these sectorial policies and programmes on a comprehensive, coordinated and continuous manner, leading to a high quality of life, is what could be defined as Urban Development.

# ENVISIONING AN INCLUSIVE INDIA BY 2047

**HITESH VAIDYA  
UTSAV CHOUDHURY  
KANJIKA BANSAL**

*“It is evident that inclusion and universal access are the non-negotiable aspects to achieve the key objectives of the New India – excellence, and efficiency above all. With India taking up the G20 presidency, now is the most opportune time to build the ‘Setu of Solidarity’, where inclusion, sustainability and resilience will bring together an increasingly fragmented world and steer it towards ‘One Earth, One Family and One Future’.”*

**Key Words:** Inclusivity, built infrastructure, disabilities, PwDs.

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*This paper presents a vision for an inclusive India by 2047. It analyses inclusivity at various levels, and the policies, programmes and legislative support mechanism for an inclusive and barrier free environment, ensuring access for all, including the persons with disabilities. The paper highlights that inclusion and universal access are the non-negotiable aspects to achieve the key objectives of the New India.*

## INTRODUCTION

Over the past 75 years, since its independence, India has made significant progress across all social and economic sectors. India’s growth story has been impressive and innovative, and holds great promise for the future. The *Azadi ka Amrit Mahotsav* has been showcasing India’s accomplishments since 1947 and illustrating ‘unity in diversity’ among the Indian population, presenting India’s development and belief of ‘*Ek Bharat - Shreshtha Bharat*’. Today’s India is an **AtmaNirbhar Bharat (Self Reliant India)**, with a firm belief in the Gandhian concept of “**Sarvodaya** through

**Antyodaya**, implying the welfare of all through the weakest of the society”: a philosophy perfected through the history of independent India, which has always been at the frontier of global commitments and efforts towards non-discrimination and inclusion.

From being the signatory to the United Nations Convention on Rights of Persons with Disabilities (UNCRPD), to enactment of the Rights of Persons with disabilities Act (RPwD) in 2016, India has come a long way in achieving the vision of empowering persons with disabilities (PwDs) and enabling their active contribution in socio-economic activities of the country. India is home to over 20 million PwDs, of which 31% resides in urban areas. Although, with a threefold increase in types of disabilities, the number of PwDs are expected to significantly increase in the upcoming population census. By 2047, Indian cities are expected to see a surge in aging and ailing populations along with general demographic growth. It is estimated that the largest

number of elderly persons will be residing in India by 2050 constituting about 20% of the population (United Nations). About 50% of the population consists of women, who have transitional accessibility needs during different phases of life. Besides, independent living and individualistic culture is becoming popular, and is increasing the challenges of urban living for these vulnerable demographics, especially with intersectional identities. It is, therefore, imperative to empower all, irrespective of their age, gender, or disability, and provide a facilitating urban environment to ensure active engagement in economic activities.

### **INCLUSION & BUILT INFRASTRUCTURE IN HISTORIC INDIAN CITIES**

Inclusion is not something new to Indian architecture or urban design. Traditionally, in terms of their environmental, economic and social planning paradigms, old Indian cities were inherently sustainable and inclusive, while ensuring the compactness of the built and density of dwelling. Other important aspects included a diverse land use mix, compact development, dwelling density, internal and external connectivity, sequential open spaces, walkable neighbourhoods,

access to social services, collective cohesiveness among the community, local area governance, crime & safety, economic diversification to support the socio-cultural and demographic diversity.

A strong sense of sensitivity existed among ancient societies for all marginalized demographics including PwDs. India has the proud history of great musicians, leaders, and philosophers with disabilities. It is also interesting that individuals' impairments were considered an opportunity to employ them in specific jobs. For example, persons with hearing and/or speech impairment were employed by the kings in medieval India to copy confidential government documents. In ancient India, customized education was imparted to PwDs in the communities in which they lived, in the mainstream schools alongside the non-disabled peers in a gurukul setting. Although during the colonial period, special schools were established, mostly in urban areas, they were expensive and covered only 2% of the population who needed special education.

### **LAWS & DIRECTIVES ON INCLUSION**

The values and principles of inclusivity can also be traced in **Article 14 and 15 of our**

**constitution that enshrines the principles of equality and forbids discrimination** on the grounds of religion, race, caste, sex, or place of birth, respectively. The articles under the Directive Principles of State Policy emphasized the right to education, employment (Article 41), and free compulsory education for all children under 14 years old (Article 45). Public welfare and holistic development of society and economy have been the guiding principles of Indian constitution and subsequently, governed Indian policy formulation process.

The **United Nations Declaration of Human Rights in 1946** greatly benefitted from the lessons learnt from decades of the freedom struggle and the promulgation of the Indian constitution. Some of the notable contributions include - Women's rights (**India insisted on the word 'men' be replaced with 'human beings'**), Non-discrimination (**India added the words 'colour' and 'political opinion' as criteria for non-discrimination**); Freedom of movement (**India added the article calling for freedom of movement within a country**); the right to work (**India added the principle of 'just and favorable conditions of work'**); Secularism, multiculturalism,



cosmopolitanism, indivisibility and the universality of all human rights. This resonated well with the adoption of the United Nations Convention for Rights of Persons with Disabilities (UNCRPD), ratified in 2006, to which India was one of the early adopters.

The Persons with Disability Act (1995) predates the convention, which, although propagating the social approach to disability inclusion, has identified the avenues for intervention. The PwD Act was drafted with enough foresight to enable PwDs in India to find equitable opportunities in education and employment. However, intent without conviction often fails to translate into action. Despite its attempt to address a wide gamut of societal aspects, the PwDs Act (1995) falls short to augment the quality of life for PwDs in India. As such, the Rights of PwDs Act (2016) has become one of the most progressive legislations, which advocates the right based approach. It has not only significantly expanded the spectrum of disabilities from 7 to 21 but also segued into emphasizing the concept of safety and integrity for PwDs, along with inclusion and accessibility. The Act brought the welcomed shift from 'barrier free environment' to 'universal design and accessibility' and

expanded the reservation for PwDs in both the education and employment sector, highlighting the significance of acknowledging intersectionality existing in the group. The Act also escalated the responsibility of the Ministry to formulate and effectively mainstream universal access and inclusive development into the urban future of "New India".

The *Harmonized Guidelines and Standards for Universal Accessibility in India, 2021*, developed by National Institute of Urban Affairs (NIUA) in partnership with Indian Institute of Technology Roorkee, promoted the concept of Universal Accessibility, acknowledging the diverse needs of PwDs along with urban population at large. The guidelines, launched by the Ministry of Housing & Urban Affairs (MoHUA), Govt. of India in 2021, are a leap ahead from the previous guidelines, aimed to cohesively streamline aspects of accessibility and inclusion into urban development.

### **POLICIES & PROGRAMMES PROMOTING INCLUSIVITY**

The influence of changing perspective from a social model to a right based model can be observed in recent policies and programmes.

The **Indian policy and governance landscape is demonstrating equal resolve in promoting gender and disability inclusion.** Some notable examples include launch of the *Sugamya Bharat Campaign in 2015*, rolling out the *Beti Bachao Beti Padhao campaign in 2015*, launch of the *Pradhan Mantri Ujjwala Yojana*, and formulation of the *National Policy of Persons with Disabilities, 2006* and its subsequent revisions, the *National Policy for Women Empowerment in 2001*, are focused on empowering PwDs and women in India. From an urban perspective, the launch of the *Smart Cities Mission, Atal Mission for Rejuvenation & Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana (PMAY)* have all instilled the core values of inclusion and universal accessibility in some form or the other. There exists a range of programmes at the national level which cater to the essentials of the urban populace, like PDS (for food security), BPL cards (for housing, electricity, etc.), RSBY smart cards (for health), among many others. The *National Assistance for Social Protection* provides support in both kind and as pension to the vulnerable groups of PwDs, widows, and elderly. While these schemes were really effective during COVID-19, they require periodic modifications

considering the growing challenges and aspirations.

The social security schemes have been completed by many transformational schemes introduced to ensure 360-degree empowerment of PwDs and strengthen the ecosystem to cater for their needs and aspirations. For instance, *NIRAMAYA*, one of the latest schemes to ensure Affordable Health Insurance to PwDs, not only covers the facility for OPD treatment but also transportation costs. The scheme *Badhte Kadam* aims at community awareness, sensitisation, social integration and mainstreaming of PwDs. The aspects of care giving have also been recognised in many schemes including, *VIKAAS, a Day care scheme*, primarily for enhancing interpersonal and vocational skills; *SAHYOGI (Care Associate Training Scheme)*. Schemes such as *SAMARTH* provides respite care and *GHARAUNDA* ensures an assured home and minimum quality of care services throughout the life of the PwDs. At present, more than 3000 special schools for the disabled children are functioning across the country, a leap in number compared to a mere 100 schools at the time of independence.

While the progress is commendable, we need to keep aiming bigger and better. As India is aspiring to be a

five trillion-dollar economy, it would require each and every citizen to become an active contributor in the economic activities. As we pave the way for a more progressive future, it is imperative to focus on the welfare of all the sections of the society. Our current growth trajectory makes it an opportune time to embrace **progressive models that focus on empowering individuals to fulfil their fundamental duties** and integrate inclusion as a **cross cutting component of urban development**.

## REDEFINING INCLUSION

But the question to ask is: what is Inclusion? Is it limited to the representation of those who are marginalized, or is it something more? One way to describe inclusion, from a structural standpoint, is that it can be categorized as **equity in access to spatial, social, economic and digital resources**. The explanation introduces a related concept of access or accessibility and safety of systems, structures, and services. The concept of accessibility generally points towards universality; of basic human rights. From the point of view of a built environment, accessibility is best defined as the provision of flexibility to accommodate each user's needs, preferences and ease of movement regardless of their abilities

or lack thereof. Hence, the design of any space, physical or even virtual, must be easily and equitably approachable, understandable and interactive with persons having disabilities. According to the United Nations, accessibility is a bridging tool between the special needs of PwDs and a country's social, cultural, and economic inclusion.

## INCLUSIVITY AS A PRIORITY IN PUBLIC PROJECTS

The positive effect of the shift to universal design as an approach is most observable in the public projects across the country. In just the past few years, many progressive projects and programmes have been implemented in India. Ranging from the *Multi-Sensory Park* and *Museum of Possibilities* in Chennai, *All Abilities Park* in Visakhapatnam and many others. Cities like Varanasi have attributed tenets of accessibility and inclusion in projects worth more than 200 crores. Bhubaneswar has brought in policy reforms ensuring not only PwDs but also gender and age inclusion. There is a welcome demonstration of a democratic spirit in architecture and city planning.

As the embodiment of the "New India" vision, the *Central Vista project* is a

showcase of its core values and has particularly adopted universal accessibility as one of the core components. All the spaces in the new Parliament building are fully accessible, including Lok Sabha and Rajya Sabha Chambers. There are dedicated desks in both the Chambers where wheelchairs can be parked. The building is accessible through three entrances with ramps and there are well-located elevators throughout the building promoting vertical accessibility. While the existing Parliament House,

completed in 1927, has only one accessible entrance with a ramp and no accessible toilets, the new building would have designated accessible offices for Ministers and accessible public toilets on all floors.

It is evident that inclusion and universal access are the non-negotiable aspects to achieve the key objectives of the New India – excellence, and efficiency above all. With India taking up the G20 Presidency, now is the most opportune time to build the ‘**Setu of Solidarity**’, where

inclusion, sustainability and resilience will bring together an increasingly fragmented world and steer it towards ‘One Earth, One Family and One Future’. It is the right time for India to lead the discourse by demonstrating a human-centric approach to urban planning and development. While we are transitioning from being the follower of the west or a victor standing tall to a Vishwa Guru to the world, we must promote, strengthen and celebrate India’s journey towards Inclusion of all.

1 (<https://www.thehindu.com/news/national/new-parliament-promises-improved-accessibility/article65306096.ece>)

## GENERAL GUIDELINES: CHECKLIST FOR SUBMISSION OF ARTICLES

The following checklist should be used when preparing an article for submission. Please be sure to follow the specifications exactly and completely to ensure that your article is reviewed timely manner and any delays avoided further along in the publishing process should your article be accepted for publication.

1. The paper should be created using a word-processing program (such as Microsoft Word) and should be between 3,000 and 5,000 words in length. The file may be in .docx or.doc format.
2. The paper is typewritten, double-spaced, and formatted to print on 8.5" x 11" (or A4) size paper. It is written in the third person in a clear style, free of jargon.
3. The first page of the article includes the following:
  - i. the paper’s title; and
  - ii. an approximately 200-word abstract that emphasizes the paper’s contribution to the field and its practical architectural/ planning social/ economic implications.
  - iii. the name(s), position(s), professional or academic affiliation(s), and email address(es) of the author(s), as well as the full postal address of the corresponding author;
  - iv. the name(s), position(s), professional or academic affiliation(s), and email address(es) of the author(s), as well as the full postal address of the corresponding author;
  - v. implications for practice and advancement of research,
  - vi. references,
  - vii. acknowledgments (optional; if funding for the research was received from non-personal sources, the sources must be identified in this section), and
  - viii. an autobiographical sketch.
4. The body of the paper should include the following:
  - i. an introduction to the subject,
  - ii. background information,
  - iii. discussion of procedure,
  - iv. results,
  - v. conclusions,
5. Please ensure that:
  - i. References are complete, have been arranged alphabetically by author surname and checked for accuracy.
  - ii. Reference citations in the text are referred to by author name and year. If there are more than two authors, the name of the first author followed by “, et al.” has been used.

# CLIMATE CHANGE AND SUSTAINABLE URBAN DEVELOPMENT: OUTLINING AN APPROACH FOR INDIAN CITIES

**PROF. RAMAKRISHNA  
NALLATHIGA**

*“In order to meet with climate change challenges and steer towards sustainability, cities need to come out with several counter measures that reduce the risks (or, mitigate some of the impacts) as well as that make them prepared to meet the challenges (or, adaptation measures). Such adaptation and mitigation measures can be planned through strategic planning by city authorities.”*

**Key Words:** Climate Change, Sustainable Urban development, Compact City Development, blue-green

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*Cities need to meet with the sustainability challenges in the wake of global climate change and its consequences by re-orienting their approach towards planning, regulation, conservation and disaster management. They need to promote more sustainable land use planning policies that prevent suburban sprawl, adopt better development control regulations that promote compact city development, conserve the blue-green spaces for sustainability and increase resilience through disaster management and risk profiling as well as planning. Such approaches will lead to sustainable development and reduce risks/vulnerability to climate change impacts.*

## INTRODUCTION

India is on the cusp of rapid urbanization and rapid economic growth. According to Census (2011), India's level of urbanization i.e., the share of urban to total population, was 32 per cent; it would have well surpassed 40 per cent by now. While the earlier estimates had placed India's urban population to be 591 million by 2030 AD, or 40 per cent (MGI 2010), the recent estimates forecast higher

population and urbanization levels. The UN Habitat (2022) estimates that India's urban population is expected to become 607 million by 2030 AD and 675 million by 2035 AD, which clearly indicates a more rapid urbanization. India is projected to become 50 per cent urbanized by 2050AD, but even that level might be achieved earlier if the current trends of urbanization continue at such a rapid pace. Individual experts note that India would have already surpassed 40 per cent level of urbanization (Sridhar 2020), if the urbanization is measured differently from that of official method of estimation, which is based on the conservative definition. World Bank (2013) also estimated that India's urban population would be much higher if the population in urban agglomerations is counted.

While India has been undergoing rapid urbanisation and rapid urban population growth, it has not seen a significant transformation of its' cities in terms of sustainable development. Sustainable development refers to 'the



development that meets the needs of present generation without compromising the ability of future generations to meet their own needs' (WCED 1987). Initially, sustainable development was seen rather as taking care of natural resources and environment through appropriate national sectoral strategies with little action at local level. The UNCED (1992) paved the way for global cooperation to protect natural environment and prevent adverse impacts of human activities at various levels. However, the global agenda for sustainable development did not much translate into action at local level, especially at the level of cities. Cities continued to reel under the various development pressures from rising urban population – poor basic civic services like water supply, sewerage, waste management, energy, roads and transport, poor shelter and living conditions and pollution of air, water and biological environment.

Meanwhile, the understanding of global climate change due to Green House Gas (GHG) emissions has changed the course of sustainable development from natural environment to human systems, which were causing the GHG emissions. The successive Reports of Inter Government Panel on Climate Change

(IPCC) also established that humans and terrestrial systems were going to face the consequences of a rapid rise in surface temperature (or, global warming) in many different ways (Ninan 2022). This could be in the form of increased frequency of floods, intense rainfall, coastal inundation, cyclone storm events, heat and cold waves etc. Therefore, sustainable development began to encompass those actions that are linked to attaining energy efficiency, emission reduction and resource conservation. India has been on the carbon emission rise path although its levels of per capita emissions are far below that of global average. However, India has been facing the consequence of global warming recently with the incidence of increased frequency of floods, intense rainfall, cyclone storm events, heat and cold waves etc.

Indian cities already face water shortage during summer, which is becoming acute in the recent times with a high dependence on tanker water. This can affect urban household water supply status, on which India has made some improvements. India also has severe wastewater management issues with most cities not having any wastewater treatment systems installations. Most of

the cities in fact do not have the property level coverage of sewerage systems and sewage transport systems. Waste management (collection, treatment and disposal) is ill-organised (although recycling/reuse takes place informally) in Indian cities. Further, Indian cities are planned such that they promote profligatory use of natural resources (land, water and energy); the modern concepts of 'compact city' or 'smart city' development are still alien to many Indian cities. Transportation in Indian cities is also increasingly being driven by personal vehicle use and travel distances are getting longer because of the expansion of cities. Transportation (public transport in particular) in Indian cities is inefficient that causes great discomfort and takes away a lot of productive work hours and energy of travellers.

The quality of life in cities is dependent upon the level of services and the delivery of which holds the key to availability of vital urban services like water supply, sanitation, sewerage, parks and open spaces, roads, transport, education, health and several other local services (Nallathiga 2007). All of them determine the habitability conditions of the city and the basic quality of life provided to the

citizens. Unless appropriate guidelines for formulating urban development policy are advocated, the desirable future of cities in terms of good infrastructure and living environment will not be achieved in the cities of developing countries.

Achieving the desirable future of cities is increasingly becoming a major challenge as cities are growing from large cities to metropolitan cities to mega cities, and the provision of urban services by the concerned authorities is becoming further complex. An important aspect of the rising pressure on civic service delivery is the lack of institutional response to cope-up with growth pressures through efficient and effective spatial organisation of human settlements that provide room for additional capacity of cities.

## **FRAMEWORK FOR MOVING TOWARDS SUSTAINABLE URBAN DEVELOPMENT**

### **Compact city development and smart growth**

Urban spatial form or built form and its growth are two important components of the identity of cities which can be potentially used to the advantage of creating such additional capacities within the cities to cope-up with the development pressures. This form of spatial organisation

of human settlements is what sometimes referred to as “compact cities”, which refers to compact nature of city development both horizontally, vertically, functionally and even in terms of resource consumption, and the organisation of urban spatial growth as “smart growth” so as to maximise the benefits like housing, transport, economic growth and environment. These two approaches to urban development require attention.

This view of development of cities is somewhat opposite of the traditional view of development of cities, which does not attach any judgment to the outcomes of growth and development pattern of cities. It accepts expanding suburban areas and constant building of urban sprawl as inevitable and not treated as problem as such. Although true to some extent, planning and design interventions, as in the compact urban form, and development strategies that lever existing urban land and infrastructure to achieve a better growth, as in the case of smart growth, hold a lot of promise in the ushering sustainable development of cities, particularly in the developing countries.

Both the concepts of compact cities and smart growth have an important objective of curbing urban/sub-urban

sprawl that is inefficient in several aspects. Urban sprawl is a term generally used for the expansive, rapid, and sometimes reckless, growth of a greater metropolitan area, traditionally suburbs (or exurbs) over a large area. Figure 1 shows how a compact development in the form of good density gradient will contain much smaller area than the sprawling city due to subscription to artificially low development density.

Suburban sprawl has been an important phenomenon leading land use/ cover changes that lead to increased emission on one hand and on the other hand it would require expanding infrastructure to farther areas. While sprawl cannot be completely avoided, as urban population growth necessitates urban expansion to some extent, but the inefficiencies associated with it call for utilizing existing urban land and infrastructure to the optimum, before looking for expansion in peripheral areas and beyond. Moreover, suburban sprawl is known for promoting disjointed communities, as opposed to well-knit neighbourhoods in the case of compact mixed – use development (Duany and Plater-Zyberk 2001)

“Compact city” broadly refers to development planning of urban land with a focus on higher density and better

accessibility which reduces automobile dependency. Denzwick and Saaty (1978) were the first to make an effort to define it in terms of the components such as high-density settlements, less dependence on automobiles, clear boundary from surrounding area, mixed land use, diversity of life, clear identity, social fairness, self-sufficiency of daily life, and independency of governance (Kaji, 2004). Central to the concept is the sustainability or sustainable development agenda that assumed importance after the Brundtland Commission Report (1987). It is held that the objectives of Compact cities are (Petersen, 2002): (a) to control urban sprawl and reduce vehicle kilometres by influencing the spatial structure of locations in the urban environment; (b) to support a high transit share; and (c) to keep walking and cycling (the most environmentally friendly transport modes) attractive.

“Smart growth” is a general term for land use practices that create more accessible land use patterns which reduce the amount of travel needed to reach goods and services (Litman, 2003). According to Nelson (2001), smart growth is a set of policies designed to achieve five goals: (i) preservation of public goods; (ii) minimization of adverse

land use interactions and maximization of positive ones; (iii) minimization of public fiscal costs; (iv) maximization of social equity; and (v) very broadly, maximization of quality of life. Smart growth at the core has compact city development while avoiding the ‘dough nut’ pattern of suburbanization. However, it follows different spatial patterns that provide optimal amount of development depending upon the ground conditions e.g., multiple nuclei or poly-centric development in if suburban centres are well existent, or ‘transit oriented development’ if transit corridors have already been existing (Newman and Kenworthy 1999).

### **Land use planning and development regulation**

Land use planning in Indian cities has been framed as a techno-bureaucratic tool to meet the statutory requirements. Land-use Master Plans are prepared without much vision of the future (except, forecasting based on the land space requirements) and lack any strategic orientation. They are losing relevance when the development pressures are far greater than that of the time when they are prepared; the developments on other fronts (technological, economic, financial and political) make plan as rigid instruments not serving the contemporary

needs. There are shortcomings on the part of land-use Master Plans due to the process followed for the same, which does not place citizen at the centre and give more importance to procedural aspects (Nallathiga 2016). As a result, land-use plans in India no longer serve as the instruments of change to meet the challenges of sustainability. Land-use Master Plans of Indian cities do not emphasize much on the GHG emission reduction through appropriate plan provisions, strategies and actions. There is a strong need to revise the purpose, process and elements of land use master plans so that they serve as instruments of change in GHG emission reduction and provide for climate change impacts.

The Development Control Regulations (DCRs), which determine the level and intensity of development, are also similar to land use planning as they are rigid and inflexible to the development needs of urbanization as well as the sustainable development of the cities. In India, DCRs of several large cities prescribe artificially low development density i.e., FSI or FAR, which only aids the horizontal expansion of cities due to urbanization pressures. However, such expanding cities need more and more spending on

urban infrastructure services expansion to the new areas, apart from that in the existing areas. Therefore, low FSI/FAR (which ranges between less than 1 and 2.5) prescribed by several Indian cities is leading to suburban sprawl and more spending to take urban infrastructure services to far flung areas (Nallathiga 2005). On the contrary, western cities are moving towards compact city development and revitalizing their central areas so that there could be more space for the development in an area that already has been serviced by civic urban infrastructure services. Even Asian Pacific cities also have higher FSI/FAR of more than 6. No wonder the spatial spread of Indian cities is much wider than their international counterparts. Compact and dense development of western cities helps them to conserve the natural resources and save on spending on civic infrastructure services in new remote areas (Jens and Burgess 2000). Asian cities, in particular, are able to achieve better economic growth and improved quality of life by allowing compact development (or, higher FSI/FAR) of CBD downtown areas.

### **Conservation of Natural Environment**

Cities are endowed with some natural spaces, which give much needed fresh air, water

and aesthetic environment. However, such natural spaces are increasingly lost in the process of urbanization in India, leading to the erosion of 'blue green space' and expansion of brown space. It is important to note that blue and green urban spaces in cities act as buffers that protect against flooding, pollution and storms. Cities such as Bangalore, Mumbai, Chennai and Hyderabad were in fact blessed with several lakes, gardens and ponds that were very effective in serving as water buffers. The systematic disappearance of such water bodies and open/green spaces in these cities made them vulnerable to floods on account of intense rainfall or cyclonic storms. In fact, lakes and water bodies in these cities were also serving as drinking water sources and recharge points for ground water. Cities need to plan for the revival and strengthening of existing blue green spaces so that they serve useful to current and future generations and become attractive space for recreational purposes.

Likewise, vegetative spaces, hills, natural parks and open spaces have also been shrinking across the cities due to systematic encroachment and conversion to other uses. These spaces serve several important functions to the citizens like recreation, social interaction, community

gathering, cultural events and sports events. The lack of monitoring and enforcement, poor civic apathy of citizens and proliferation informal activities have led to these spaces being either lost or shrunk or degraded into waste land with litter. Several cities also have large green spaces that serve as lungs for the city, which are lost over time. Some cities like Mumbai and Bangalore which have natural parks, serve as useful places for biodiversity heritage. Further, drains and natural drainage systems are also lost to development, which has led to the contraction of water flow and the flooding of residential areas. The floods in Hyderabad, Bangalore and Chennai are also due to the encroachment of natural drains and drainage systems by the residences and public works. The resultant effects of such loss of natural drainage is almost permanent and people in several areas reel under water logging conditions that lead to loss of lives, property and material resources. There is no effective law or enforcement that makes the offenders punishable under the civil laws besides reclaiming such systems into public domain.

### **Adaptation and Mitigation Approaches**

In order to meet with climate change challenges and steer towards sustainability, cities



need to come out with several counter measures that reduce the risks (or, mitigate some of the impacts) as well as that make them prepared to meet the challenges (or, adaptation measures). Such adaptation and mitigation measures can be planned through strategic planning by city authorities. They need to have infrastructure plans – both of development as well as O&M – to counter the climate induced challenges. Such plans need to forecast the infrastructure requirements under the scenario of climate change impacts and provide for meeting through buffering, back stop options and alternate means. For example, to meet the challenge of water supply in the event of flooding or drought conditions, the cities need to create adequate buffer capacity for storage and distribution to avoid any water supply crisis. Cities need to inculcate appropriate behavioural response of the citizens by levying additional tariff to finance such buffer capacity creation, penalize high consumption users with higher tariff rate and also incentivize citizen actions that either conserve resource (recycling or reuse) or complement municipal water supply (water harvesting systems).

Cities can also counter the climate change induced risks

by performing sensitivity analysis of the infrastructure systems to such climate induced shocks and institute systems to meet such climate changed induced shock events. Early restoration of civic infrastructure services like water supply, sewerage, waste management is essential for avoiding any aftermath events like epidemics and public health. Cities need to make use of early warning from meteorological or weather departments in order to plan their infrastructure systems. Durban city in South Africa has demonstrated how the early warning systems data on impending drought can be used to persuade citizens to reduce water demand significantly.

## RESILIENCE PLANNING

Cities are also increasingly adopting several measures to enhance the disaster resilience (Gupta et al 2019). There are a variety of approaches taken to it, but two major strands of approaches worth mentioning: (i) disaster management approach; and (ii) risk proofing and planning.

### Disaster Management Approach

Cities are increasingly taking this approach to counter the disaster events, whose incidence is increasing due to climate change. The legislative back up

– Disaster Management Act – and institutional support – National Disaster Management Authority – have also prompted the cities to make use of them effectively in the large as well as wider scale natural disasters. An important component of this approach is pre-disaster planning, which involves monitoring of weather and climate information, analysis of such data for scenario generation, deployment of warning systems and issue of advisories to citizens. During the times of disaster event, cities are increasingly taking war room approach (or, command centre or master control room approach), which involves continuous feeding of data in a central place, dashboard display of the current disaster status, planning of logistics, transport and rescue operations, and coordination of implementation at various levels. Several cities have taken this approach during the outbreak of Covid 19 and were successful in ensuring a coordinated and concerted action towards pandemic management. However, it is an exhaustive process that requires a continuous effort and follow up.

### Risk Proofing and Planning

Cities are also increasingly resorting to drawing advance plans to meet the disaster situations e.g., heat wave

action plan, flood action plan, drought plan, epidemic plan and contingency plan etc. Such plans clearly lay down the approach and sequence of actions to be taken in the event of climate change induced disasters. Some Indian cities have such plans already in place and are using them effectively in meeting the situations. It is important for the cities to have plans so that they can follow the Standard Operating Procedures (SOP) in the event of disasters.

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# HOUSING AND SKILLING – THE INTERSECTION OF INNOVATIVE HOUSING POLICY

**ARUN BHANDARI**

*“Skill development plays a crucial role in promoting affordable housing and reducing poverty. Skill development programs provide individuals with the necessary skills to secure jobs and earn higher incomes, which in turn can help them access better housing options. According to a study by the International Labour Organization (ILO), skills development can increase the earnings of low-skilled workers by 25-50 percent.”*

**Key words:** Affordable Housing, PMAY, NULM, Skill Development, NSDM

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*This paper discusses the interrelationship between affordable housing and social development programmes. The focus of the paper is on skill development, especially in the context of the Govt of India programmes such as the National Urban Livelihood mission, and the National Skill Development Mission.*

## INTRODUCTION:

Affordable housing is a fundamental aspect of sustainable development, and it plays a significant role in addressing poverty, reducing inequality, jobs and income, and promoting social inclusion. According to the United Nations Human Settlements Programme (UN-Habitat), affordable housing refers to housing that is adequate in terms of size, location, affordability, and access to basic services, such as water, sanitation, and energy. The UN-Habitat estimates that approximately 1.2 billion people worldwide lack access to adequate housing, and this number is expected to grow with rapid urbanization.

Rapid urbanization has led to a significant increase in the demand for affordable housing, particularly in developing countries. The urban population is expected to double by 2050 and the majority of this growth will occur in cities in developing countries. However, the supply of affordable housing has not kept pace with the growing demand, leading to huge housing deficit. In addition to the housing deficit, the quality of housing for urban poor is often inadequate, with poor ventilation, lighting, and sanitation facilities. This leads to a host of health problems, such as respiratory diseases, diarrhoea, and malaria. According to a Report by the World Health Organization (WHO), approximately 3.8 million people die each year from indoor air pollution, with the majority of these deaths occurring in developing countries.

To address the affordable housing deficit and improve the quality of housing for urban poor, governments

and non-governmental organizations (NGOs) have implemented various housing programs. These programs focus on providing affordable housing units, improving housing infrastructure, and promoting sustainable and inclusive housing. The biggest impediments to implementing affordable housing schemes have been economic growth, availability of cheap and subsidized land, tenure rights, jobs and income opportunities. It is clear that conventional top down affordable housing policies did not worked well in the past. The success of any social and affordable housing program requires a multi-pronged strategy. Social policies, such as the provision of basic services, can improve the living conditions of urban poor. Development programs, such as the National Urban Livelihoods Mission (DAY-NULM) in India, can provide skill training and employment opportunities to urban poor. Affordable housing finance, such as microfinance and housing subsidies, can make housing more affordable and accessible to low-income families.

Innovative housing programs should focus on the integration of education, skill development, women empowerment, gender issues, and access to finance and credit. For example, the

Pradhan Mantri Awas Yojana (PMAY) in India provides housing subsidies to eligible families and emphasizes the participation of women in the housing construction process. The program also focuses on promoting sustainable construction practices and improving the quality of housing units.

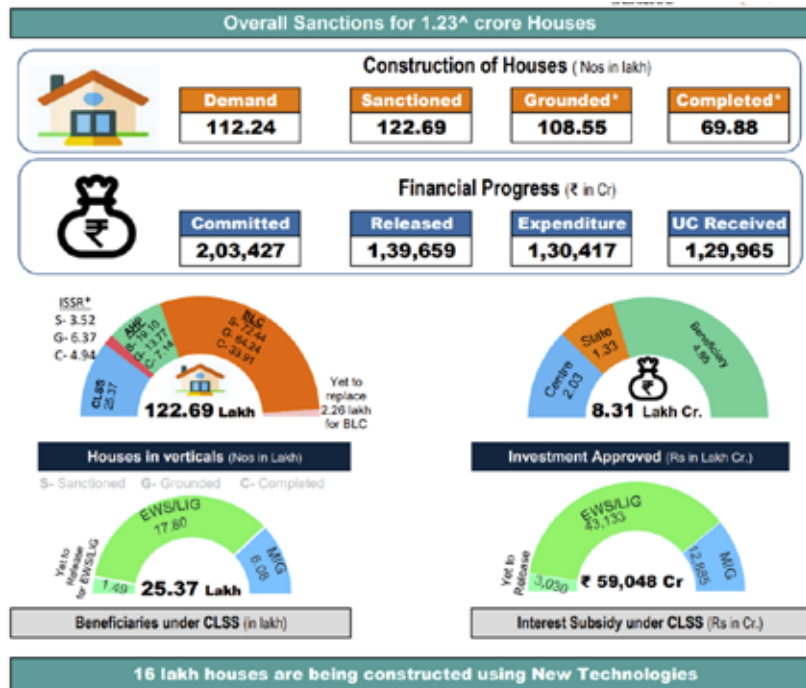
### SOCIAL POLICIES AND HOUSING DEVELOPMENT PROGRAMS

Social policies and development programs play a crucial role in promoting affordable housing. For example, India’s Pradhan Mantri Awas Yojana (PMAY) aims to provide affordable housing to all eligible

beneficiaries by 2022. The program provides financial assistance to low-income families to construct or purchase a house. Similarly, the Skill Development Mission and Digital India Mission have been instrumental in improving the quality of construction and promoting innovative construction practices.

The PMAY-Urban seeks to address the affordable housing requirement in urban areas through following programme verticals:

- Slum rehabilitation of Slum Dwellers with participation of private developers using land as a resource;
- Promotion of Affordable



(Source: <https://pmay-urban.gov.in/uploads>, Access date 22 Feb 2023)



Housing through Credit Linked Subsidy;

- Affordable Housing in Partnership with Public & Private sectors; and
- Subsidy for Beneficiary-Led individual house construction / enhancement.

## AFFORDABLE HOUSING FINANCE

Affordable housing finance is essential for promoting sustainable and inclusive housing. However, access to finance remains a significant barrier for low-income families. The best policies and practices for affordable housing finance include innovative financing mechanisms, such as microfinance and community-based finance, and public-private partnerships.

## INNOVATIVE HOUSING PROGRAMS

Innovative housing programs should focus on the integration of education, skill development, mason training, women empowerment, gender issues, and access to finance and credit. Here are some examples of global and Indian case studies:

**Mexico:** The Mexican government's Social Housing Program provides affordable housing to low-income families through a public-

private partnership model. The program provides subsidies and technical assistance to developers to build affordable housing units. The program has been successful in improving the quality of housing for low-income families.

**Singapore:** The Singapore government's Home Ownership Program provides affordable housing to Singaporeans through a combination of subsidized housing and public rental flats. The program has been successful in promoting homeownership and reducing inequality.

**India:** The Ahmedabad Slum Networking Project (ASNP) is a collaborative effort between the Ahmedabad Municipal Corporation, NGOs, and the private sector to improve the living conditions of slum dwellers in Ahmedabad, India. The project provides basic infrastructure, such as water supply, sanitation, and street lighting, to slum areas. It also provides affordable housing units to eligible families through a community-driven approach.

**Brazil:** The Brazilian government's *Minha Casa Minha Vida* (My House My Life) program aims to provide affordable housing to low-income families through a public-private partnership model. The program provides

subsidies and technical assistance to developers to build affordable housing units. The program has been successful in reducing housing deficits and improving the living conditions of low-income families.

Global and Indian case studies provide examples of successful affordable housing programs that can be replicated in other countries and regions. *The Minha Casa Minha Vida* program in Brazil has provided affordable housing to millions of low-income families through a public-private partnership model. The *Baan Mankong* program in Thailand has provided secure tenure and improved housing infrastructure to slum dwellers through a community-driven approach. The *Women's Habitat Network* in Kenya has provided training and employment opportunities to women in construction and housing-related industries. The program has been successful in promoting women's economic empowerment and improving the quality of construction in housing projects.

These examples also reinforce the fact that affordable housing is critical for promoting sustainable development and addressing poverty and inequality. Governments and NGOs should focus

on implementing housing programs that provide affordable and sustainable housing units, improve housing infrastructure, and promote sustainable and inclusive housing.

### **INTEGRATION OF EDUCATION, SKILL DEVELOPMENT AND WOMEN EMPOWERMENT**

According to a Study by the Centre for Policy Research, the affordable housing sector in India has the potential to create 3.3 million jobs by 2022. In addition, the Study estimates that the sector could contribute up to 1% of India's gross domestic product (GDP) by 2025. Innovative housing programs should focus on the integration of education, skill development, and women empowerment.

In India, the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission

(DAY-NULM) aims to provide skill training and employment opportunities to urban poor. The program focuses on women's empowerment by providing special incentives for women entrepreneurs. The program has been successful in improving the economic status of urban poor and promoting sustainable livelihoods. Skill development plays a crucial role in promoting affordable housing and reducing poverty. Skill development programs provide individuals with the necessary skills to secure jobs and earn higher incomes, which in turn can help them access better housing options. According to a study by the International Labour Organization (ILO), skills development can increase the earnings of low-skilled workers by 25-50%.

The DAY-NULM is also an example of a skill development program that

has been integrated with affordable housing. The program aims to provide skill training and employment opportunities to urban poor and homeless individuals. Through the program, beneficiaries can access training in a variety of sectors, including construction and housing-related industries. The program also provides support for entrepreneurship development and access to credit.

The National Skill Development Mission (NSDM) in India is another example of a skill development program that can support affordable housing. The program aims to provide skill training to 400 million people by 2022 and create job opportunities in various sectors. By providing individuals with the necessary skills, they can secure higher-paying jobs and access better housing options.

*Pic 01: Construction Skill Training workshop and PMAY-G field visit site, UNDP Odisha*



Despite the many initiatives under the NSDM, the implementation of skill development programs in India remains a challenge. According to the India Skills Report 2021, only 45% of India's workforce has received any kind of formal training. In addition, there is a significant regional disparity in the availability of skill training opportunities. States such as Maharashtra, Tamil Nadu, and Uttar Pradesh have the highest number of training providers and enrolled candidates, while states such as Jammu and Kashmir, Himachal Pradesh, and Arunachal Pradesh have the lowest.

In order to address these disparities, the Government of India has initiated a number of measures. One such measure is the creation of a state ranking system, which aims to encourage states to improve their performance in skill development. The ranking is based on a number of different factors, including the number of training providers, the number of certified candidates, and the availability of infrastructure and resources for skill training.

One of the global best practices in skill development is the German model of dual

vocational training. In this model, students are trained in both theoretical knowledge and practical skills in a company environment. The German model has been successful in providing highly skilled workers to the industry and has contributed significantly to the country's economic growth.

The Habitat III New Urban Agenda resonate with the best practices and sets up a new urban horizon. The NUA 2016 also reassures the skills development for economic growth and equal opportunities. Empowering women and girls, children and youth, older persons, persons with disabilities, indigenous peoples, local communities, and those in vulnerable situations is crucial for effective urban and territorial development decision-making. Capacity-development initiatives that strengthen skills and promote human rights and antidiscrimination are needed to ensure their participation in shaping governance processes and engaging in dialogue.

In India, the NSDM has launched various schemes for the skilling of both the skilled and non-skilled workforce. Some of the schemes are:

- Pradhan Mantri Kaushal Vikas Yojana (PMKVY):

This scheme provides monetary rewards to individuals who successfully complete a training program. The scheme aims to provide training to youth who are either unemployed or underemployed.

- *National Apprenticeship Promotion Scheme (NAPS)*: This scheme provides financial incentives to employers who hire apprentices. The scheme aims to promote apprenticeship training and increase the number of apprentices in the country.
- *Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)*: This scheme provides training and employment opportunities to rural youth. The scheme aims to provide training to youth who are poor and unemployed.

According to the rankings of 2020, Maharashtra is the top-ranked state in terms of skill development, followed by Tamil Nadu and Uttar Pradesh. Jharkhand, Nagaland, and Manipur are the lowest-ranked states.

Capacity building activities of the new home owners can also have a significant

impact on the success of affordable housing programs. Capacity building activities can include training on financial management, home maintenance, and community building. By providing individuals with the necessary skills to manage their finances and maintain their homes, they can improve their quality of life and ensure the long-term sustainability of the housing units. For example, as part of inclusive planning, PMAY-Grameen and *Biju-PakkaGhar* in Odisha have ensured the home owner gets the skill, learn Geo-tagging, get paid wages during training and also self-build the house through construction education and training. The programme helped build the community resilience during COVID-19 impact. UNDP India State Odisha Office and Government of Odisha one of the leading the examples of capacity building and delivering housing promises in cyclone affected and other disaster risk areas of Odisha. The challenges were manifold: Use of local media, NSDM qualification packs translated into local language materials in housing construction, quality construction awareness and the Digital interface are changing the passive to active affordable housing policy-making.

In the US counties, for example, a US\$1 increase in university expenditures leads to an 89-cent increase in the urban income. Richmond, US offers free/subsidized solar power and home energy efficiency programs, and the Richmond BUILD program trains young individuals in building trade skills to install the equipment. Cooler housing designs can reduce energy consumption and heat stress, especially for vulnerable populations. These initiatives aim to lower energy costs, reduce greenhouse gas emissions, and promote sustainable economic growth. In China, Suzhou Industrial Park has set up its own technical and vocational training colleges. This has resulted in stronger linkages between skills supply and actual needs of the local industries as well as boosting productivity and competitiveness of the industrial park. These measures were complemented with talent attraction strategies such as housing subsidies (*World Cities Report, 2022*).

The impact of skill development on the social and economic well-being of individuals is significant. Skill development can improve the self-confidence and self-esteem of individuals, and it can

provide them with the necessary tools to improve their financial situation. In addition, skill development can lead to the creation of new businesses and job opportunities, which can contribute to economic growth and development.

## CALL FOR INNOVATIVE POLICIES

Housing Policies have always been very sensitive to market forces and social impact. Cost of materials and implementation mechanism systemic impact on the local economy and the society have always been cited as the housing policy low-hanging fruits. The advancement in technology, rate of adoption of digital governance model and market-linked economic policies have reshaped the affordable housing schemes across many policy interventions. The housing policies in the new urban order can create a multiplier effect through adoption of the following measures:

- The private and public sector can benefit from affordable housing programs, having strong institutional mechanism and facilitatory regulations and policies in place;
- Pro-active regulatory and administrative



provisions of housing policies;

- Policy convergence efforts- linking social, direct beneficiary schemes and upskilling policies with the Housing programmes;
- Promotion of multi-stakeholder partnerships and local engagement; and
- Creation of pool of skilled labour in the local economy. The construction and housing-related industries can create job opportunities and contribute to economic growth

Access to affordable housing can improve the health and well-being of individuals, which can lead to reduced healthcare costs and increased productivity. City governments have a range of opportunities to improve openness and engage with residents through connected and digital technologies. While e-government is often used for one-way communication, there are innovative examples of cities using technology for active citizen participation, such as

interactive apps and online platforms.

## CONCLUSION

In conclusion, skill development is critical for promoting affordable housing and reducing poverty and create equal opportunity in jobs and income growth. Skill development programs can provide individuals with the necessary skills to secure jobs and access better housing options. Capacity building activities of the new home owners can also contribute to the success of affordable housing programs. The private and public sector can benefit from affordable housing programs through job creation and economic growth. The National Urban Livelihoods Mission and the National Skill Development Mission in India are examples of successful programs that have integrated skill development with affordable housing.

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# WATER WIVES FOR WATER PIPES

## Moving Towards Gender Equality in Context of G20

*The author highlights how the social structure of rural Indian society is changing as a result of water scarcity. It is a severe problem of water scarcity that leaves villagers resorting to polygamy, an illegal and punishable act. The women are completely responsible for water management and viewed as the link between the household and the water sources.*

On a scorching hot summer day in an unknown village in western Maharashtra, the melodious tinkling of anklets caught my attention. I turned towards the direction of the sound and saw two frail women heading towards a water well. I enquired from them, as the only living being one could catch sight of on this hot day were the vultures flying in the sky. In return, the lady pointed towards the well. I asked them if they had to fetch water from this well often, and the same lady replied, “Both of us are married to the same man, and we must walk several miles here to fetch water for our family. We are the ‘*paanibais*’ (water wives).” *It appalled me to see women being reduced to substitute of water pipes. This crisis of severe water shortage has put them at a higher risk of vulnerability.* I inquired how the women got married to the same man.

“I am named Sarita, which means ‘princess’, but I was never treated as one. Upon turning fifteen, my parents wed me off to an older, already married man belonging to a high caste. Soon after, I got pregnant. I could not carry heavy vessels of water anymore, so my husband married again and Sheela (pointing to the other woman) became the third wife.” told Sarita.

Sheela never spoke a word.

Staring at her, Sarita said, “Once she was the liveliest girl in her village, but on a fateful night, she was molested. Her parents married her off to the man willing to accept her husband, since he needed a younger *paani bai*.” Tears rolled down Sheela’s face as it reminded her of her traumatic childhood. I cradled her hand, and she placed her other hand over mine.

Sheela finally spoke with teary eyes, “There is a river flowing by, merely 10 kms away from our village but all of the water supply is diverted somewhere else”. As the hissing of the vultures echoed in the sky, I saw the women walk towards the well, their two shadows merging into one.

Returning to the bus awaiting me, I opened my research work and started drafting a chapter on the tales of Sarita and Sheela.

My report highlights the irony of our cities, otherwise known as the ‘Engines of Growth’, using water meant for village people’s livelihoods and domestic consumption and returning it to rivers, polluted. Despite all the catchment areas of rivers and dams being built on these rivers being in rural areas, the bulk of water is supplied to cities due to the disparity between rural and urban areas.

As the moon rose, I concluded the chapter with this observation ‘*There cannot be security of women without security of access to water.*’

Katyayani Malhotra

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# CITIES AND UNION BUDGET 2023-24

**SOUMYADIP  
CHATTOPADHYAY  
ARJUN KUMAR**

*“The first budget of Amrit Kaal (2022-2047) has recognized the growth potentials of Indian cities and is aimed to build ‘sustainable cities for tomorrow’, with a roadmap for infrastructure financing and governance reforms.”*

**Key Words:** Union Budget, Flagship Programmes, Cities, CAPEX

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*This commentary article analyses the provisions towards Urban India flagship schemes in the current budget, and discusses the key takeaways and policy implications.*

## INDIAN CITIES AS ENGINES OF ECONOMIC GROWTH IN AMRIT KAAL

Indian cities with their contribution of around two-thirds of the GDP are expected to play an instrumental role as the country’s engines of economic growth. A majority of these cities are hamstrung by serious infrastructural issues and governance deficits. As per the recent World Bank Study, our cities need an investment of \$840 billion over the next fifteen years. Investment requirement for basic urban services (e.g. water supply, sewerage, waste management, roads, street lights, stormwater drainage) is estimated at about \$450 billion and another \$300 million is for building mass transits. So, strengthening the city governments and having a budgetary provision for financing urban

infrastructure assumes special significance. The “first budget of Amrit Kaal (2022-2047)” has recognized the growth potentials of Indian cities and is aimed to build ‘sustainable cities for tomorrow’, with a roadmap for infrastructure financing and governance reforms.

## URBAN INDIA FLAGSHIP SCHEMES

The total Budget Estimate (BE) available for urban development (Ministry of Housing and Urban Affairs (MoHUA)) has experienced a slight drop from INR 76,549 crores in Financial Year (FY) 2022-23 to INR 76,431 crores in FY 2023–24 of about INR 117 crores. The Revised Estimate (RE) for FY 2022-23 stood at INR 74,545 crores. Although the REs and BEs were quite close to each other, the actuals for the financial year 2021-22 were stooping INR 1,06,840 crores, owing to the PM Awas Yojana – Housing for All by 2022. This decline is attributed mostly to the thrust and budget outlay given in previous years towards Housing for All by 2022.

## BUDGET - MINISTRY OF HOUSING AND URBAN AFFAIRS (In ₹ crores)

Centre's Expenditure	Actual 2021-22 Total	Budget Estimate 2022-23 Total	Revised Estimate 2022-23 Total	Budget 2023-24 Total
Gross Recoveries Receipts Net	106840	76549	74545	76431
Total MRTS and Metro Projects	23473	23875	20401	23175
PMAYU- 1. Credit Linked Subsidy Scheme (CLSS) - I for Economically Weaker Section (EWS)/Lower Income Group(LIG)	12000	0	11221	0
Pradhan Mantri AwasYojna Urban (Total)	59963	28000	28708	25103
Deendayal Antyodaya Yojana- National Urban Livelihood DAY- NULM	794	900	550	0
Pradhan Mantri's Street Vendors's Atmanirbhar Nidhi (PM - SVANIDHI)	297	150	433	468
AMRUT (Atal Mission for Rejuvenation and Urban Transformation)	7280	7300	6500	8000
Smart Cities Mission - Mission for Development of 100 Smart Cities	6526	6465	8465	7665
Smart Cities Mission – City Investment to Innovate, Integrate and Sustain (CITIIS)	64	33	334	334
Total- Smart Cities Mission	6587	6800	8800	8000
Swacch Bharat Mission Urban	1951	2300	2000	5000

Source: <https://www.indiabudget.gov.in>

Two flagship programmes of the MoHUA – the Smart Cities Mission (SCM) (Mission for Development of 100 Smart Cities) and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) (Urban Rejuvenation Mission – 500 Cities) – have bagged higher budgetary allocations together from INR 14,100 crores (BE) in 2022-23 and INR 15300 crores (RE) in 2022-23 to INR 16000 crores (BE) for both in FY 2023-24 (actual for FY 2021-22 was INR 13,868 crores).

The AMRUT has received BE for FY 2023-24 of INR 8,000 crores (FY 2022-23: with BE of INR 7,300 crores & RE of INR 6,500 crores; FY 2021-22 with actual INR 7,280 crores). The SCM also has received BE for FY 2023-24 of INR 8,000 crores (FY 2022-23: with BE of INR 6,800 crores & RE INR 8,800 crores; FY 2021-22 with actual INR 6,587 crores). The component of City Investment to Innovate, Integrate and Sustain (CITIIS) has again received BE of INR 334 crores like the last year. As compared to the previous

year, the SCM has an uptick in RE for FY 2022-23, unlike in Covid19 years.

The scheme for Metros and MRTS, which has almost the entire amount as capital expenditure (CAPEX), has witnessed a slight decline in the BE for FY 2023-24 at INR 23,175 crores as compared to BE for FY 2022-23 which was INR 23,875 crores (RE for FY 2022-23 was INR 20,401 crores and actuals for FY 2021-22 was INR 23,473 crores). The National Capital Region Transport Corporation (NCRTC) has been allotted



BE of INR 3596 crores for FY 2023-24 (BE & RE for FY 2022-23 was INR 4,710 crores).

The Pradhan Mantri Awas Yojana Urban (PMAY-U) has seen a decline in the BE for FY 2023-24 at INR 25,103 crores as compared to BE for FY 2022-23 which was INR 28,000 crores (RE for FY 2022-23 was INR 28,708 crores and Actuals for FY 2021-22 was INR 59,963 crores). The scheme is financed from Central Road and Infrastructure Fund, having the Extra budgetary resources (EBRs) component.

PMAY-U has four components - In-situ Slum Rehabilitation (ISSR), Affordable Housing in Partnership (AHP), Beneficiary-led individual house construction/enhancement (BLC) (these three are under centrally sponsored scheme) and Credit Linked Subsidy Scheme (CLSS), a central sector scheme, for Economically Weaker Section (EWS), Lower Income Group (LIG) and Middle Income Group (MIG). The CLSS scheme has been discontinued altogether in this Budget. There has been a decline in the Budget for PMAY-U as the Housing for All by 2022 target has been met. However, following the discontinuation of the CLSS scheme, problems of lack of access to credit and affordability for the urban poor bracketed in the EWS and LIG categories would only intensify.

The budgetary allocations for Swachh Bharat Mission Urban (SBM-U) have more than doubled from INR 2,300 crores (BE) in 2022-23 and INR 2,000 crores (RE) in 2022-23 to INR 5,000 crores (BE) in 2023-24 (actuals for FY 2021-22 was INR 1,951 crores). Earlier, the SBM-U was financed by *Rashtriya Swachhata Kosh* – Central & State component. Higher financial allocation is complemented with the provision for scientific management of dry and wet waste through the complete transition from manhole to machine-hole mode, a switch to mechanical desludging of septic tanks and sewers in all cities and towns. A greater emphasis has been given to sanitation and mechanization of such activities.

### OTHER SCHEMES

At the same time, the allocation towards Deendayal Antyodaya Yojana-National Urban Livelihood Mission (DAY-NULM) has been discontinued and has been reduced to INR 0.01 crores, a number staggeringly low compared to the previous year's estimates (BE for FY 2023-24 was INR 900 crores and RE was INR 550 crores).

Nonetheless, the Prime Minister's Street Vendors' Atmanirbhar Nidhi (*PM SVANIDHI*) sees a substantial increase in its allocation from INR 150 crores (BE 2022-23) to

INR 468 crores (BE 2023-24) (RE for FY 2022-23 was 433 INR crores and actual for FY 2021-22 was 297 INR crores). Therefore, the DAY-NULM budget can be seen shifting towards *PMSVANIDHI*, albeit, with its limited focus on street vendors. However, increase in budgetary allocations under the DAY-NULM could be more impactful for the urban poor engaged in the urban informal sectors and their livelihoods and more so, as they are yet to fully withstand the COVID19 induced economic losses. Speaking of other centrally sponsored schemes, Jal Jeevan Mission is also one such scheme that sees an increase in its budgetary allocation from INR 60,000 crores (BE 2022-23) to INR 70,000 (BE 2023-24).

### NEW INDIA'S INFRASTRUCTURE AND CAPEX PUSH

The main focus of this year's Union Budget has been increased Capital Expenditure. With the objective to increase the share of manufacturing in the GDP of India, the National Industrial Corridor Development Programme (NICDP) is being implemented whereby 32 greenfield industrial smart cities under 11 industrial corridors are being developed with world-class Plug-n-Play infrastructure. The 'Plug-n-Play' model has been put

in place to avoid digging of roads every time a pipeline or cables have to be laid down.

It promotes planned infrastructure where separate lines for communication, sewage, water, industrial effluents, electricity and gas are laid all at once, preventing re-digging and re-laying of roads. The National Industrial Corridors have seen an increase in its budgetary allocation from INR 1500 crore (BE) in 2022-23 to INR 2000 crores (BE) in 2023-34. At the same time, the actual expenditure was INR 1104 crores in 2021-22.

In addition to this, the Hon'ble Finance Minister, in her speech, spoke of the scope of the impetus of *PM Gati Shakti National Master Plan* for Multi-modal Connectivity, which will encompass seven engines for economic transformation, seamless multi-modal connectivity and logistics efficiency. Proper implementation of this scheme could address the poor state of logistics and supply chains in the smaller cities and better connect them with their larger counterparts, and thus, push for planned and balanced urbanisation.

## IMPROVING THE FINANCIAL HEALTH OF CITIES

One of the key takeaways of the Union Budget is the

setting up of a Rs 10,000 crore per year Urban Infrastructure Development Fund (UIDF) under the aegis of the National Housing Bank (NHB) for the purpose of financing urban infrastructure. Funds under the UIDF are expected to be amassed through the use of priority sector lending shortfall with the specific aim of creating urban infrastructure in Tier-2 and Tier-3 cities.

This Budget has also announced incentives for improving the creditworthiness of the city governments to enable them to access the capital market for financing urban infrastructure. However, the finances of city governments are in a grossly unsatisfactory state. As per the ICRIER (2019) Report, municipal revenue remained stagnant at around one per cent of GDP during the period from 2007-08 to 2017-18 and the municipal own revenue as per cent of GDP was only 0.43 per cent in 2017-18.

Among the different categories of city governments, Municipal Corporations contribute nearly 80 per cent to India's municipal own revenue owing to their strong economic base and the capacity to mobilise sufficient tax and non-tax revenues. Importantly, the revenue autonomy ratios (proportion of the tax and

non-tax revenue in total municipal revenue) for all the city governments registered declined from 51 per cent in 2010-11 to 43 per cent in 2017-18. This indicates the growing fiscal dependency of the city governments, especially the Municipal Councils and Nagar Panchayats, on higher levels of government for meeting their revenue shortfalls.

Reforms in property tax governance and ring-fencing of user charges, as announced by the Finance Minister, are, therefore, timely interventions for improving the financial health of the city governments. Property Tax is the most important urban local tax in India and its importance has increased in the post-GST period. However, with a contribution of only 0.15 per cent to India's GDP, the revenue collections from property tax are significantly low.

Wide spread use of manual and paper-based systems of property register; improper valuation methods without any link to actual (market) value of properties; inefficient tax collections and absence of penal measures for delayed or non-payment of property taxes coupled with lack of grievance redressal mechanisms have seriously undermined the revenue generation potentials of property tax in India.

Moreover, the city governments in India hardly utilize user fees to cover even operation and maintenance costs of basic services mainly due to narrow political compulsions, e.g., fear of losing votes and peoples' dissatisfaction with the municipal services. The recent World Bank Report highlighted that water and sewerage utilities in Indian cities recovered, on average, only 55% of their operating costs in recent years. So, successful operationalization of the budgetary announcements remains a huge challenge for Indian cities.

The Fifteenth Finance Commission's grant conditionalities in the form of notification of floor rates for property tax and subsequent linking of property tax collections with the growth of states' own GSDP lay strong foundations for the financial accountability of municipalities. In addition, it requires overhauling the current practices, at a much higher scale as envisioned in this year's budget. In fact, the success of these reforms is dependent on garnering sufficient and sustained public and political support at the city levels. Equally important is to empower the city governments to impose taxes and fees and to strengthen the linkages between local taxes and local expenditures

on municipal services by encouraging accountability and transparency of the city governments to their citizens.

An analysis of crime rates given by the National Crime Records Bureau (NCRB) suggests that cities in India fare poorly in terms of safety of living. The World Air Quality Report, prepared by Swiss organisation IQAir, is an index that listed 35 Indian cities with the worst air quality tag for 2021, and little has changed since then. With respect to the ease of doing business, India ranks 63<sup>rd</sup> across the world among 190 countries. Of late, the climate change induced risks including cyclones, flooding, heat waves and so on have made the Indian cities vulnerable due to their location and diversity of geography. Mainstreaming climate change mitigation and adaptation measures in urban planning and policy frameworks is critical. Therefore, we need regional planning with active involvement of empowered city governments.

### **PROMISING YET CONCERNING**

This Union Budget has a renewed thrust for municipal bond issuances. However, municipal bonds accounted for less than one-tenth of the total commercial debt raised by the city governments during 2011-18. Out of the

94 cities under the Smart Cities and AMRUT programs, only 59 per cent received an investment grade rating or above in 2018. In the last four years, out of 28 Municipal Corporations securing investment-grade credit ratings, only five cities issued municipal bonds. Apart from the weak financial health of the city governments, several structural bottlenecks including non-transparent financial management, absence of specific laws for addressing the insolvency of the cities, over-collateralisation and absence of secondary markets constrain the municipal bond market in India.

While it reemphasizes the need for greater fiscal autonomy of the city governments, it is equally necessary to build their capacities to manage commercial debt financing in a meaningful, effective and transparent manner. Indian Cities urgently need an integrated policy and regulatory environment to improve revenue mobilization and to access and leverage public as well as private funds for financing urban infrastructure on a sustainable basis.

In essence, Indian cities are undoubtedly the largest drivers of economic growth in the 21<sup>st</sup> Century, but not at the cost of inequity and lack of

inclusivity. With an increasing population and an expanding economy, actions must be undertaken to enable the country to urbanise. During the timeline of the Amrit Kaal, rethinking and prioritizing urban policies and practices is urgently required to facilitate growth with inclusiveness towards New India @ 2047.

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# RESPONSIVE GOVERNANCE THROUGH ACTION ORIENTED PUBLIC LISTENING

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*“The e-Governance initiative works on the principle of action-oriented public listening. The project has already handled more than 1.3 million grievances online, with around 96 percent disposal. Moreover, the project has helped in reaching to nearly 6.0 million people, providing them with livelihood options including food, shelter, and travel assistance during the COVID-19 pandemic.”*

**Keywords:** Action-oriented listening, inclusiveness, Citizen centric governance, Participatory governance, Convergence

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*The case study from West Bengal presents an e-Governance initiative, which works on the principle of action-oriented public listening. The project has already handled more than 1.3 million grievances online, with around 96 percent disposal. Moreover, the project has helped in reaching to nearly 6.0 million people, providing them with livelihood options including food, shelter, and travel assistance during the COVID-19 pandemic. Through this project, people lodge public grievances, and they pass through an incisive analysis leading to identification in gaps in policies and service delivery bottlenecks. The data analytics are shared with policymakers at sufficiently higher levels in administration to aid them in designing need based micro-schemes and large-scale public outreach programs. Enhancing people's access to the government substantially, 3561 Bangla Sahayata Kendras have been set up across the state, providing citizens a comprehensive platform for people to interact with the government.*

## INTRODUCTION TO THE PROJECT

The Monitoring of Programme Implementation and Grievance Cell, set up in West Bengal in June 2019, is aligned with the United Nations' Sustainable Development Goals, which envisage promoting sustainable development and improving well-being of the people. The project's main objective is to create a transparent, accountable, and responsive environment for public services delivery system steering the State Government's multiple public welfare schemes for the larger benefit of its people.

Through this project, people lodge public grievances and they pass through an incisive analysis leading to identification in gaps in policies and service delivery bottlenecks. The data analytics are shared with policymakers at sufficiently higher levels in administration to aid them in designing need based micro-schemes and large-scale public outreach programs. Enhancing people's access to the government substantially,

3561 Bangla Sahayata Kendras have been set up across the state, providing citizens a comprehensive platform for people to interact with the government.

The e-Governance initiative works on the principle of action-oriented public listening (Figure 1). The project has already handled more than 1.3 million grievances *online*, with around 96 percent disposal. Moreover, the project has helped in reaching to nearly 6.0 million people, providing them with livelihood options including food, shelter, and travel assistance during the COVID-19 pandemic.

More than what statistics reveals, the project continues to enjoy its status as a seminal government initiative, flexible enough to adapt to the changing needs of the people as well as government’s willingness to prioritize public welfare from time to

time.

Drifting from the traditional development paradigm, the State Government conceived this 2-fold ICT-driven project for action-oriented public listening. A robust back-end user interface connecting 53 departments at the state level with 23 Civil Districts, 6 Police Commissionerate, 28 Police Districts, and 4505 sub-offices at the district level has been developed under constant vigilance and supervision of the highest administrative authority in the State. With emerging technologies as a backbone, this e-Gov initiative has significantly reduced service-delivery time and has greatly enhanced the government’s regulatory capabilities. The project has also successfully executed the catalytic role in:

(a) ICT infrastructure development across the province;

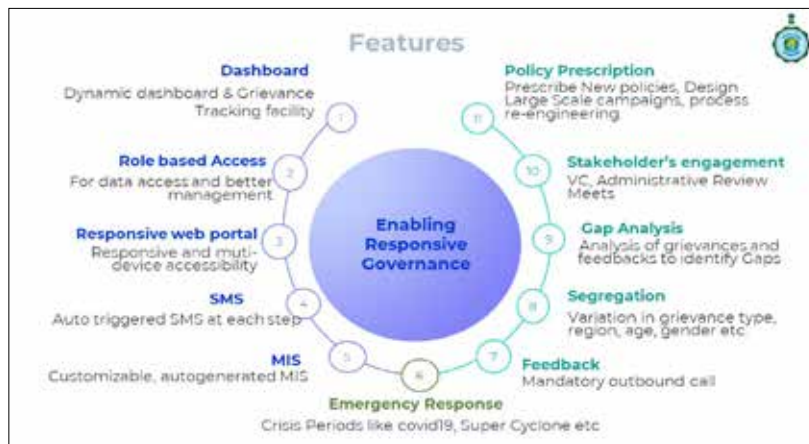
(b) Enhancement of e-Literacy at all hierarchical levels in government, especially the grassroots; and

(c) Enablement of e-Presence of Government Departments.

Constant monitoring of progress has resulted in re-engineering of existing processes, deletion of redundant steps and adoption of more citizen-friendly practices initiated by concerned departments sometimes. Sometimes, however, they were spearheaded by the Office of the Hon’ble Chief minister, ushering in necessary changes in both policy and implementation frameworks. The ICT-driven innovation has made it possible for the government machinery to reach out to the citizens who might have been excluded so far from the development process. It is a scalable and replicable model that offers opportunities for other governments seeking to improve the quality of life of their citizens, ensuring positive impact and outcomes in their lives.

The web application has enabled a person to lodge grievances with ease **anywhere and anytime (24x7) following the whole of government and whole of society**. Citizens can lodge a

Fig 1: e-Governance Module for action-oriented listening



grievance via BSKs, phone, SMS, or email to address their issues.

- To ensure user convenience, multiple channels of communication are in place with several closer access points to make comprehensiveness of reach of faceless services, including Online services, Pull/Push SMS, Email, and a dedicated Helpdesk.
- It is portable across the browsers and it provides a system-generated unique registration number for each grievance. Grievance tracking facility by complainant name/mobile no./ lodged date etc. is another feature of the portal.
- Seamless data transmission among the administrative units (Depts. / Offices/ Sub-Offices).
- Automatic triggering of SMS to stakeholders, including status updates.
- Seamless integration of a wide array of modern ICT technologies - the Web, SMS Gateway for Auto Notifications, Data Analytics & AI-driven trend analysis.
- Dynamic color-coded dashboard facilitating

ease of monitoring and review.

- OTP-based two-factor authentications for accessing the portal provide convenience and security to users.
- Role-based functionality and data access for better management in redressing grievances.
- Testimonials on various facets of grievance redressal are uploaded as good practices and easily accessible for replication in different governance domains.
- Mandatory feedback before disposing of grievance and classification of disposed grievance for undertaking GPR and providing implementation level suggestions.

Making public service delivery more inclusive and transparent, this e-governance initiative has been working with the motto, *“No one left out, No one left unheard.”*

## BEGINNINGS

The initial study primarily involved collecting data on grievances from various silos and defining the problem statement. Grievances related to different services and schemes were classified based on descriptions and concerned

resolving authorities. Accordingly, grievance categories were defined and mapped to the department/district, and relevant sub-offices created under each Head of the Department (HoD). A senior official had been earmarked as Nodal Officer coordinating with the Cell and Sub-Offices. To standardize the Management Information System (MIS) Reports, 11 closure reasons were defined, and the HoD must mandatorily select one to redress a grievance along with remarks.

To ensure active participation of the HoDs, weekly auto-generated MIS was triggered to them, with colour coding and appropriate flagging. The pendency tacker module was introduced to provide a gist of all pending grievances for less than seven days, 7-15 days, 15-30 days, and more than 30 days. To evaluate the quality of grievance resolution, outbound calls were made to complainants to obtain feedback. Gaps in service delivery were identified and mitigated with the help of periodical grievance disposal indexes and routine quality verification of grievances disposed by authorities. Based upon set parameters on grievance redressal, administrative review meetings are conducted with the heads of the departments

to ensure quality in disposal of grievances.

**MANAGING CHANGE**

In development parlance, any change is liable to be met with intransigence. In the initial stages of its roll out, stakeholders hesitated to use the new system because of initial apprehension about the grievance redressal mechanism.

Various campaigns were undertaken to reach a more extensive section of society. The project’s resilience during crises like COVID-19, and super cyclone YAAS, the widely publicized success stories, newspaper testimonials, extensive outreach campaigns, and the continuous feedback helped win confidence of the people. The work to align 4505 administrative units under different departments to the mechanism of expeditious grievance redressal was in itself a humongous task. Gradually, acceptance of the grievance redressal reports highlighting key inputs, policy prescriptions, and the direct supervision of the Hon’ble Chief Minister helped to unfreeze the bureaucratic inertia and bring traction helped to set the ball roll.

**WORK-FLOW**

The e-governance system enable citizens to voice their concerns through many different avenues such as the Bangla Sahayata Kendras

(BSKs), Call Centres, e-Mail communications etc. Once the particular grievance is deciphered and it is found that some information is missing, then an outbound call is made from the Cell to record relevant data. The grievance is forwarded to the concerned Head of Department/District Magistrate as the case may be. The HoDs, based on the nature and category of grievances, forward them to the concerned sub-offices. The sub-office contacts the applicant, resolves the grievance and submits the Action Taken Report (ATR) to the HoDs. The HoDs review the ATRs; if the ATR meets the internal parameters which show satisfactory resolution of grievances, they forward it to the grievance cell. It is at this point that the team at the grievance cell makes another outbound call to the complainant to assess the quality of the grievance and obtains feedback of the

complainant. The grievances are then classified, disposed and archived for further use. At every step of grievance redressal, a status update is provided to the petitioner through SMS.

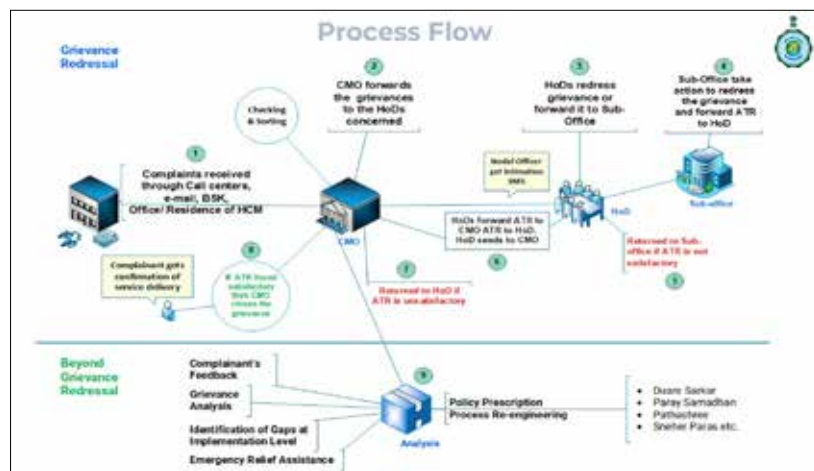
The archived grievances are used for data analytics. Inputs from the analysis are used to design further outreach initiatives like Duare Sarkar, wherein the services with the most gaps in delivery mechanism, along with flagship schemes of the government, are taken up in a camp mode at citizens’ doorsteps (Figure 2).

**TOWARDS SUSTAINABLE HABITAT**

Implementing a programme for sustainable habitat through grievance monitoring involves following key steps.

1. *Define the scope and objectives of the programme:* The goals

Figure2: Process flow of Programme Implementation & Grievance Handling





should be specific, measurable, achievable, relevant, and time-bound (SMART). For example, defining the focus areas of a programme like sustainable housing, ensuring access to adequate housing for all, creating opportunities for education, welfare schemes, etc.

2. **Identify the stakeholders:** Identify the target stakeholders who will be affected by the programme and those who will be involved in its implementation.
3. **Establish a unit to design the blueprint:** The MPI&GC is directly responsible for coordinating the resolution process of grievances, identifying gaps, introducing policy prescriptions, and developing programmes to address the root cause of the grievances and create an impact.
4. **Train the team:** Train all the stakeholders responsible for handling grievances to relate to the overall purpose of achieving the bigger goal.
5. **Establish a feedback mechanism:** To allow stakeholders and complainants to receive

updates on the status of their grievances. A mandatory outbound call is made to record the applicant's feedback and suggestions.

6. **Monitor and evaluate the programme:** Monitor and evaluate to ensure the objectives are met. Starting from data collection, categorization of grievances received, focusing on the response time, geographical spread, age group concentration, etc., to identify a pattern in the data set.
7. **Communicate results:** Communicate the results to relevant stakeholders, policymakers, and citizens to build transparency and accountability. This includes highlighting successful initiatives, sharing best practices, and addressing areas where improvements are needed.

## FINDINGS

Data-driven policy-making is a process of making informed decisions based on analysis of data. It draws meaningful information out of different data sets that have emerged from the system. In this way it has been helping the policymakers make informed and evidence-based decisions.

First, the Cell established a process for collecting and analysing data using appropriate tools and techniques. This involved collecting data from multiple sources like feedback, surveys, and administrative records besides the existing grievance dataset. The next step was to clean and organize the data for analysis. Subsequently, statistical and analytical techniques were used to identify patterns and trends in the data. Finally, these insights were used for decision-making as policies were based on evidence and data rather than intuition or anecdotal evidence.

However, data-driven policymaking also carefully considers privacy, ethics, data quality, and effective communication and collaboration among stakeholders. It is not a one-size-fits-all solution and is therefore tailored to the specific needs and goals of the state Government.

The objectives for undertaking an analytical study of the flagship programme are: (i) faster distribution of benefits; (ii) streamlining of the existing processes; (iii) ensuring direct benefit transfer; and (iv) documentation and dissemination of success stories.

This data-driven analysis involved steps as follows:

- Collection of data from various sources;
- Data analysis;
- Modelling;
- Data interpretation; and
- Data presentation.

The analysis can be further broken down into subcategories like statistical and diagnostic analysis of closed grievances. The descriptive analysis drew insights from past data by re-modelling it in ways that would make it more meaningful. Department-wise or district-wise study of grievances presented a synoptic overview. The diagnostic study similarly identified patterns in grievance data. It was instrumental for analysts use patterns embedded with

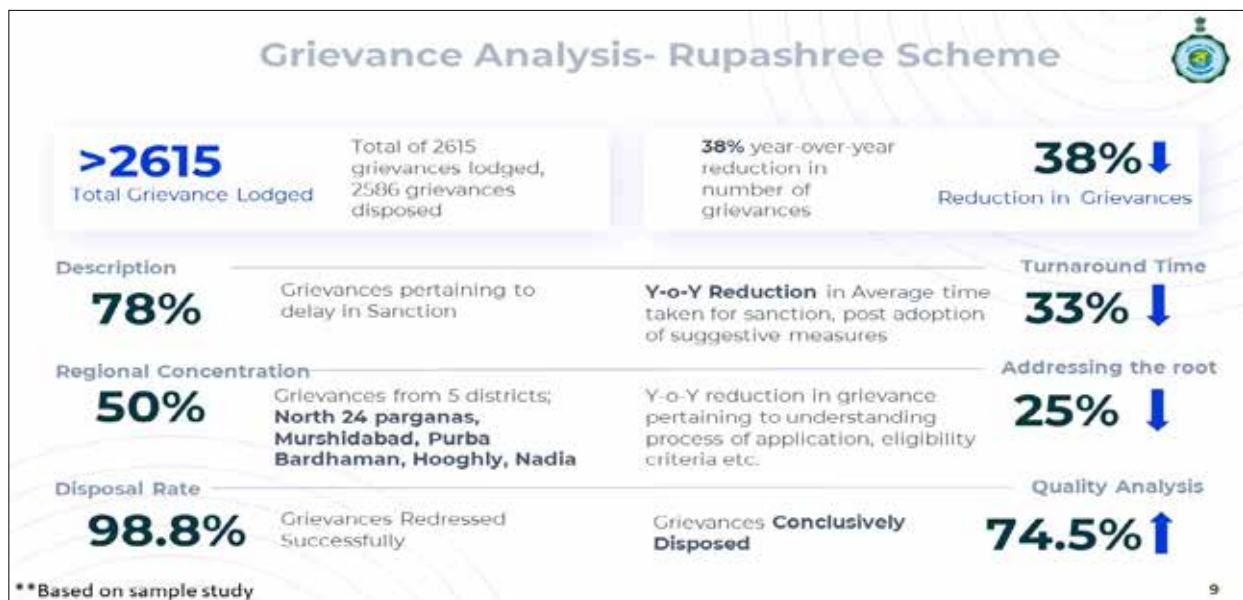
older data to solve current challenges. The analyst could draw conclusions from the disposed data set by selecting samples. Disposed homogeneous grievances were analysed thoroughly, conclusions were drawn, aiding in prescribing policy and implementation level changes.

Around 0.6 million grievances received against 21 flagship programmes were carefully analysed. The grievances were further categorized into sets of 3-5 districts, where such grievances majorly were concentrated. Furthermore, a detailed study of grievances on each programme was undertaken to reveal significant reasons of service delivery falling behind citizens' expectations. For example, it was found

that 40% of the grievances related to Kanyashree Scheme belonged to 5 districts of the state (Figure 3). 3 major grievance categories covering around 65% of the grievances were delay in sanctioning amount post successful verification, technical issues during form submission, and understanding the eligibility criteria. Again, study of the Khadya Sathi Scheme revealed that nearly half of the grievances pertained to only 4 districts indicating issues with the delivery mechanism in the concerned districts. 3 major grievance categories constituting over 80% of grievances were:

- Not receiving benefits under the scheme post application;
- Understanding the application process; and

Fig 3: Grievance Analysis of the Rupashree Scheme



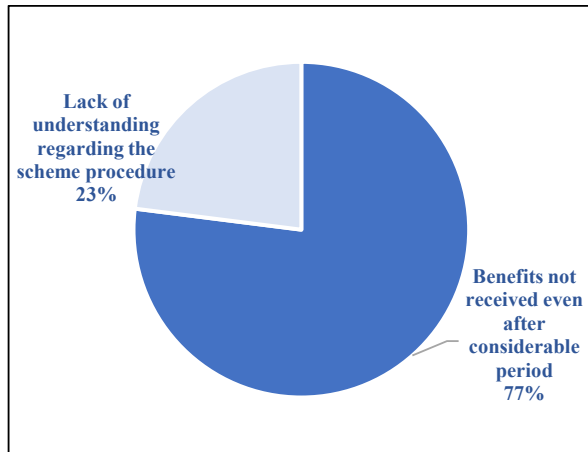


Fig 4: Analysis of Grievances of Artist Pension

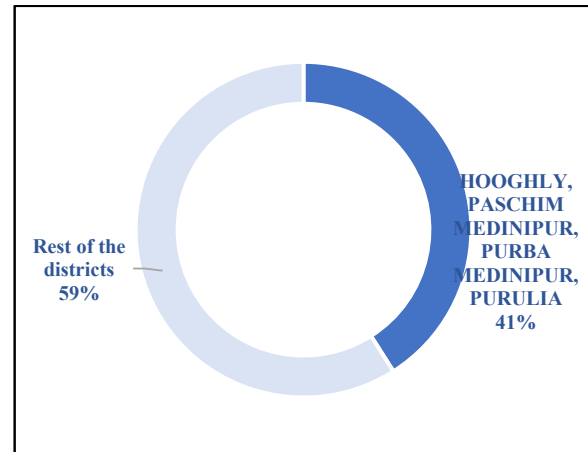


Fig 5: District-wise distribution of Grievances

- Requesting an increase in the amount funded by the financial institution.

In line with the change request proposals coming out of the field, the cell suggested from time to time, changes in the policy framework and implementation, varied from; changing the eligibility criteria, simplification of application form, increasing budget allocation, organizing special outreach camps, reducing paperwork, and so on.

#### Artist Pension Scheme for the year 2020-22

It was found that 4 districts accounted for nearly 41% of the total grievances, wherein the maximum number of grievances were related to non-receipt of benefits after application signalling implementation level issues (Figures 4 & 5). The findings were shared with

the concerned authorities to refine the implementation process.

#### ALIGNMENT WITH SDGs

The SDGs are 17 global goals the United Nations adopted in 2015 as part of the 2030 Agenda for Sustainable Development. These goals cover many areas: poverty, health, education, gender equality, climate action, and sustainable cities and communities. The United Nations has established a global SDG monitoring framework, which includes 232 indicators used to measure progress toward achieving the SDGs. The framework is designed to adapt to national contexts and allows countries to select arrows most relevant to their specific circumstances.

SDG monitoring also involves tracking progress toward achieving the SDG targets and identifying areas where

more traction is needed, like identifying gaps and designing strategies to address these gaps, engaging with stakeholders to ensure that the monitoring process is transparent, accountable, and participatory.

Many challenges were faced in implementing new programme or modifying an existing one:

1. **Inequality and Poverty:** Addressing inequality and providing essential services require targeted interventions that prioritize the needs of marginalized and vulnerable segments of the population.

This project ensured that pension benefits pending for over 0.5 million eligible citizens were sanctioned in a record time through well-gearred inter-departmental coordination.

2. **Lack of Infrastructure, Limited resources:** Launching new programmes often involves enormous costs. Hence mobilizing existing available resources optimally becomes critical.

All the BSKs are running in existing infrastructure like district offices, primary health care centres, libraries, etc. The data entry operators hired provided employment opportunities in the state.

3. **Resistance to change:** Addressing resistance to change requires effective communication and engagement strategies built and implemented at the ground level to support the programmes.

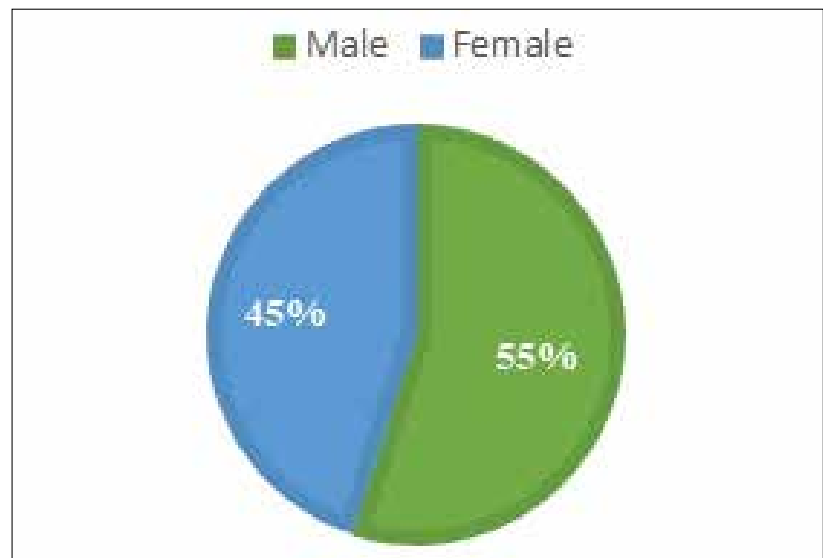
The success of arguably one of the most extensive public outreach campaigns speaks volumes about the effectiveness of communication right at the ground level. The alignment with SDGs can be seen from the following:

Applicants get status updates on their grievance at each level of redressal procedure through SMS/ voice calls to ensure transparency in the grievance disposal process upholding its democratic legitimacy and earning public trust (SDG 16.5 & 6). Through this Project, vast numbers

of grievances on livelihood pensions were received, enquired through field-level offices, and were taken up with the Department of Social Welfare, which ensured direct financial benefit to over 0.5 million aged, widow, and specially-abled beneficiaries across this state (SDG 1). The Khadyasathi and other food-related schemes received around twenty-one thousand grievances resolved within record time (SDG 2) by the Departments of Food and Supply. Shelter-related applications for over fifty thousand families (SDG 2) have been ensured by the Department of Disaster Management and Housing and Panchayat & Rural Development. This Project aided in the successful implementation of universal health coverage under the “Sasthya Saathi” scheme of

the State government (SDG 3) to over eight thousand beneficiaries. Ensuring equitable access to education (SDG 4), this project facilitated by addressing over eleven thousand applications on various educational initiatives of the State government, such as *Kanayashree* (scholarship and financial support for girls for further studies), *Sikshasree* (Educational Scholarship for social and economically backward communities), *Aikyashree* (Educational scholarships to students from minority communities), Swami Vivekananda Scholarship (for Higher Education), etc. amongst others. To promote gender equality (SDG 5), this project redressed around three thousand grievances regarding gender-based domestic violence to curtail all forms of atrocities against

Fig 6: Gender Parity in Grievances





women (Figure 6). It has also successfully handled roughly eight thousand grievances relating to women's welfare schemes of the state government, such as *Kanyashree* (scholarship and financial support for girls or further studies) and *Rupashree* (Financial aid against child marriage), amongst others.

This project facilitated hundreds of women in getting benefits under the "*Lakshmir Bhandar*" Scheme (monthly financial assistance for basic household needs). Through *Bangla Sahayata Kendra's* (BSKs), this project ensured service delivery at the grassroots at zero service charges. The outreach campaign, "*Duare Sarkar*," widened the scope of public service delivery to all at their doorsteps for all government flagship welfare schemes (SDG 10).

## IMPACT

Evaluation Study confirms social and institutional impact of the initiative in following ways:

- a) Reducing bureaucratic inertia in service delivery;
- b) Reducing need for multiple visits to public offices by citizens;
- c) Benefit of large-scale data analysis through ICT-enabled system to pinpoint implementation

level gaps, vis-à-vis MIS in the conventional grievance redressal system;

- d) 45% and 63% of complaints come respectively from women and adult members of the families. It endorses the level of acceptance and trust people have shown in the system. Women's enthusiastic participation in schemes such as the 'Kanyashree, 'Rupashree' and educational scholarships is aligned with the observation above;
- e) Massive public response in micro schemes and outreach programmes formulated based on policy prescriptions of this Cell endorses the credibility and efficacy of this initiative;
- f) The study recommended the Cell's existing framework of using grievance inputs for policy re-engineering and transformation of governance to make the project effective and sustainable in the long run;
- g) As an extension of the Public Grievance Redressal System, *Bangla Sahayata Kendras* have been successfully bringing out to the fore

the grievances at the grassroots; and

- h) The evaluation indicated certain challenges like over-dependence of citizens on system and, with rising expectations, people's tendency to lodge grievances on very simple or personal issues.

The project has helped women access public services through the single-window platform without taking the pain of visiting multiple field offices. Field survey and data analysis revealed that women have voiced 45% of the total grievances lodged. Moreover, 67% of service requests and grievances originated from rural areas, 33% grievances from urban areas. Social category-wise grievance distribution shows a uniform pattern, with 52% being general caste, 20% from SC & ST, and 28% from other Backward classes.

The project has successfully established a concerted and coordinated effort of 4505 public Institutions under a single platform for delivering public service in a responsive, accountable, and time-bound manner throughout the state.

During the first 6 months of its inception, the cell received around 30,897 grievances. With increased publicity and awareness, the figure reached

Fig 7: Socio- economic impact



to 9,49,840 in the year 2020. The initiative has come up with policy prescriptions helping the government formulate micro-schemes, including ‘Duare Sarkar’ (Government at doorstep), ‘Duare Ration’ (Public Distribution System at doorstep), ‘Paray Samadhan’ (supra-local problem resolution), ‘Pathashree’ (undertaking road construction/ repairing simultaneously across the State), ‘Sneher Paras’ (Special assistance for stranded migrants during COVID 19 lockdown) and many others (Figure 7).

**SUMMING UP**

An online portal to redress public grievances is nothing new in the parlance of present-day digital governance worldwide. But the Public Grievance Monitoring Portal of the State is unique

in its comprehensiveness. It works on “Whole-of-the-Government” approach under the highest administrative authority (the Hon’ble Chief Minister). Grievance narratives, inputs, and feedback are constructively used for undertaking government process re-engineering (GPR) of different flagship schemes of the State Government. Quite a number of micro-schemes have been conceived to include persons who have been excluded. Set service level with an inbuilt alert SMS facility, pendency checker, grievance status update to citizens, and feedback ensures transparency and accountability at every level of service delivery mechanism.

Through “Bangla Sahayata Kendras” people can connect

to highest state authorities over public service delivery problems, doing away with ‘come tomorrow’ syndrome that may be present in some corners of bureaucracy. The project has been evolving since its inception incorporating necessary changes in key systems.

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# URBAN PLANNING AND BIODIVERSITY – A CASE OF BHOPAL

**DR. SHUBHASHISH  
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PUNTAMBEKAR**

*“The threats to this biodiversity are mainly due to urban growth as encroachment of land for urban growth and developments over the catchment areas have started affecting the water bodies. Sprawling agricultural activities, avifauna affected by pollution and lack of proper & effective management mechanisms are equally detrimental.”*

**Keywords:** Urban Planning, biodiversity, Bhopal, Sustainable Development

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*Urban development Planning and biodiversity share a close interrelationship with each other and are two facets contesting the same land. It is a challenge for the administration and planning authorities to maintain a balance between them. Bhopal, the capital city of Madhya Pradesh is blessed with an abundance of water and vegetation within the urban area. This Case Study highlights the need for protection of biodiversity in sustainable urban development and the collective efforts of the people and administration in conserving the riches.*

## INTRODUCTION

Bhopal, the capital city of Madhya Pradesh (India), is located at an average elevation of 427 meters (1401 ft) on hilly terrain within the Malwa Plateau (23 16'N, 77 22'E). This City is well connected with all other major cities of India by rail, road and air. The city has a Municipal area (administrative area) of 298 square kilometers and a population of 1,795,648 (as per the 2011 census).

The City is situated in hilly terrain sloping downwards in north and south-east directions. The spread of the City is guided by the hillocks of varying altitudes situated in the north-west and the south-west portion of the city, shaping the morphological character of the city. These hillocks form a continuous belt from Singarcholi up to the Vindhya range. The hillocks can be classified in various orders depending upon their altitude and geographic continuity, ranging from high altitudes with moderate slopes to gradual slopes with more or less flat lands. The major soil types are clayey and loamy soil. Deccan trap basalt and Vindhyan sandstone are the main geological formations found in Bhopal. The topographical characteristics of Bhopal can be described as follows:

**1st order** Singarcholi (Manwa Bhand), Lalghati, Idgah, and Fategarh situated to the north of the upper lake at high altitudes, with moderate slopes;

**2nd order** Shyamla, Dharampuri and Arera Hills

are situated south-east of upper lake at medium altitude but have steep slopes, slopes as high as 35%, and undulating terrain;

**3rd order** M.A.N.I.T. Char-Imli, Shahpura, Kotra Sultanabad and other hillocks adjoining southeast of Upper Lake have gradual slopes, with low intensity of variations in topography; and

**4th order** Eastern parts of city comparatively plain without any significant variation, gradually sloping towards the northeast, forming the bowl shape landform.

Bhopal is also known as the “city of lakes” for an extensive presence of water bodies consisting of as many as 33 lakes around the city. The total area of the water bodies is 3825 ha. The area to be conserved under the catchment is around 9415 ha. The *Bada Talab* or the Upper lake or Bhojtal was created by a massive earthen bund constructed across the river Kolans by Raja Bhoj of Dhar in the 11th century A.D. covering an area of 34.84 sq. km., having a catchment area of 371 sq. km. and full tank level is 508.17 m. It is the oldest man-made lake in Asia. The lake has high utilitarian value as it has rich biodiversity and is also an important source of drinking water for the city of Bhopal.

Water bodies and green cover are under constant threat of urbanization. Suitable development control regulations are required to safeguard the eco-sensitive areas of the cities. All water bodies and their catchment areas need to be protected, and controlled development allowed as per local area plans under such mechanism, which may provide for Green TDR. (BMP 2031).

The city of Bhopal displays an abundance of biodiversity in fresh water and terrestrial ecosystems (Figure 1). The reserved forest (Van Vihar) around the upper lake is a protected area rich in flora and fauna. The topography of

the City is an asset for its rich bio-diverse character. The lakes and the hills together provide a huge open space, which acts as lungs for the city. Around 12,000 ha of land are covered by tree canopy.

A wide variety of species of flora and fauna including 272 species of flowering plants, 92 species of medicinal plants, 102 species of birds, 16 species of mammals and 13 species of reptiles are found in Bhopal. The flora of the City includes 78 rare species of flowering plants and more than 600 species of micro plants and insects etc. (106 species of *Macrophytes* (belonging to 87 genera of 46 families of which 14 are rare species) and 208 species

Figure 1: Regional Map showing blue and green in Bhopal (Source: Draft BMP 2031)





of Phytoplankton (comprising of 106 species of Chlorophyceae, 37 species of Cyanophyceae, 34 species of Euglenophyceae, 27 species of Bacillariophyceae and 4 species of Dinophyceae). The fauna includes 105 species of Zooplanktons (Rotifera 41, Protozoa 10, Cladocera 14, Copepoda 5, Ostracode 9, Coleoptera 11 and Diptera 25). Fish fauna consists of 43 species (natural and cultured), 27 species of avifauna, 98 species of insects and more than 10 species of reptiles and amphibians (including 5 species of tortoise)). This makes Bhopal a reservoir of biodiversity with different types of flora and fauna. (LBSAP Bhopal 2012)

The threats to this biodiversity are mainly due to urban growth as encroachment of land for urban growth and developments over the catchment areas have started affecting the water bodies. Sprawling agricultural activities, avifauna affected by pollution and lack of proper & effective management mechanisms are equally detrimental. Discharge of untreated sewage into the lakes and open areas utilized as garbage dumps are found to be the prime reason for the spread of diseases like malaria, dengue, etc. Plantations done with singular species are also affecting city biodiversity.

The administrative partners include various State Ministries such as the

Ministry of Environment and Forest, and Ministry of Water Resources; organisations functional under them include Lake Conservation Authority (LCA), Environmental Pollution and Coordination Organisation (EPCO), Ecotourism Board; Special created cells like Capital Project Authority (CPA), Bhoj Wetland Authority, Bhopal Municipal Corporation (BMC) and Town and Country Planning Organization (TCPO). Consistent measures have been taken to protect the natural assets of the city through the plantation, conservation of water bodies and development of city-level parks.

Collective efforts of all stakeholders will ensure the sustainable growth of the city. Under the Environmental Sensitive Planning, the draft Master Plan 2031 proposes legal prescriptions for less or no development along the upper lake with a 50 m buffer of no construction zone to protect the health of the catchment. Other water bodies like kerwa and hataikheda reservoirs, Kaliasot and Kolans Nadi drainage network spread from sehere to Betwa Nadi, Ghodapachad and Halali Nadi in planning area have a 33 m of green belt. The unique feature of housing a national park in a municipal corporation area adds to the green infrastructure of the city

with a challenge to maintain it. With a reserve forest just at the boundary of the city with a continuous green corridor (18 identified tiger corridors) and birds' migratory path, the city experiences the coexistence of wildlife and humans without harming each other.

Planning initiatives of allocating the land on hills to institutions like WALMI, MANIT, IIFM, Dronachal and city-level parks on the continuous spaces on the hill slopes have been effective in protecting the landform and vegetation. The situation is not so good in the newly developed sprawls, they are facing concerns of high population density and scanty vegetation absence of public parks. The approach of Environmental sensitive Planning and sensible land use planning will be the key to achieving the vision of ABCD (overall Biodiversity Conservation and Development).

*“Develop a sustainable relationship between people and nature by protecting and enhancing the biodiversity of Bhopal for the people and by the people.”*



## CHAUPAL PE CHARCHA: WASTE MANAGEMENT, TECHNOLOGY AND CIRCULARITY

Dehradun Cantonment Board hosted the “Doon Cantt Swachhta Chaupal” on 3 and 4 February, 2023. This was a first time initiative in Uttarakhand that brought together waste management start-ups and companies, government officials, urban local bodies and NGOs on one platform. The theme of the event was Waste Management, Technology and Circularity and provided an opportunity to 51 entrepreneurs to exhibit their products to government officials who are looking for best available technologies to combat challenges of ever increasing waste. The Chaupal was supported by the Urban Development Directorate, Government of Uttarakhand and was organized in collaboration with Cantonment Board’s Knowledge Partner; Social Development for Communities (SDC) Foundation.

Amongst the large number of attendees were Municipal Commissioners and Executive Officers from Urban Local Bodies who are spearheading the Swachh Bharat Mission initiatives, heads and members of Zila Panchayat, Gram Panchayat, CEOs and Members of Cantonment Boards, decisionmakers, elected representatives and NGOs working in the field of sanitation who learnt about new initiatives in the field of sanitation. Students from prestigious colleges and government training institutes were also present in large numbers. Several well-known national organizations such as NEPRA, Aterro, Recykal, Saahas, and prominent startups such as Padcare, Spruce Up and ShyanaEcounified participated in the Chaupal.

One of the key highlights of the Chaupal was the launch of a “Mountain Oriented Swachhta Technology Challenge”. The Challenge is targeted at start-ups and students for designing a machine for picking legacy garbage from valleys & slopes in towns, tourist spots & across mountain states in India.

The Doon Cantt Swachhta Chaupal was inaugurated by Chief Guest, Hon’ble Governor Uttarakhand, Lt Gen Gurmit Singh: PVSM, UYSM, AVSM, VSM (Retired). Hon’ble Minister of Urban Development, Government of Uttarakhand Shri Premchand Agrawal was the Chief Guest for the valedictory session. Hon’ble Minister of Agriculture, Soldier Welfare and Rural Development, Government of Uttarakhand Shri Ganesh Joshi presided over the closing ceremony. People present at the closing ceremony took a pledge to make Uttarakhand clean and beautiful, to segregate garbage from their homes, not to use single plastic and to associate at least five people with this campaign. Buoyed by the success of the inaugural Chaupal, Cantonment Board has decided to make this an annual affair.



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*(The writer is the founder of Dehradun Cantonment Board’s Knowledge Partner, the Dehradun based not-for-profit organization; Social Development for Communities (SDC) Foundation).*

# हडको राष्ट्र के लिए संपदा निर्माण



राष्ट्र को समर्पित सेवा का 52<sup>वां</sup> वर्ष मनाते हुए हडको, भारत में सतत आवास एवं शहरी विकास का असली चैंपियन रहा है। प्रमुख तकनीकी वित्तीय संस्थान होने के नाते हडको समाज के सभी तबकों के लिए शहरी आवास एवं इंफ्रास्ट्रक्चर का वित्तपोषण करता रहा है। एक जिम्मेदार कॉर्पोरेट होने के नाते हडको अपनी जानी-मानी सीएसआर परियोजनाओं के माध्यम से समाज के वंचित वर्गों की सेवा में सदैव अग्रणी रहा है।



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