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+ Our collective intelligence will lead future of cities

+ Reforming India's urban governance

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UrbanUpdate

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Readers' comments, criticism and suggestions are welcome. Letters to the Editor can be sent by e-mail, or regular mail. They should include name, address, phone number(s), and e-mail address, if available. The subject of the communication should be clearly mentioned, and we reserve the right to edit for sense, style, and space.

Address

Urban Update (All India Institute of Local Self-Government)
Sardar Patel Bhavan, 22-23, Institutional Area, D Block
Pankha Road, Janakpuri, Delhi-110058

FOR SUBSCRIPTION AND ADVERTISING RELATED ASSISTANCE, CONTACT
Phone: 011 - 2852 1783/ 5473 (Extn. 37)
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CITIES OF THE FUTURE

Rajiv Agarwal
Editor-In-Chief
dg@aiilsg.org

What do citizens wish for? One gets to one's workplace riding the metro in 20 minutes.Pay-and-use bicycles or electric scooters provide the first and last mile connectivity. 90 per cent of all waste in one's neighbourhood is recycled and turned into new material or upcycled. One gets uninterrupted water supply at home for drinking and other uses separately, at reasonable, fair cost. 95 per cent of the time, the air quality in the city is within prescribed limits. These could be on the wish lists of citizens as a new year dawns upon us and we look with hope towards more efficient, equitable and sustainable cities.

While the challenges facing policy makers and urban planners are complex and stubborn, there is hope that these will be overcome and there will be steady progress towards creating more livable cities. This confidence stems from the focus of governments at national and sub-national levels on the urban landscape and attempts to improve the lot of the common man.

Innovation could become a valuable tool for administrators in the journey towards a better urban future.

Challenges in the areas of urban mobility, waste management, housing and service delivery are particularly stubborn and will test the ingenuity of our policy makers. Housing is a high priority to address the needs of large sections of the population including the rural-urban migrants. Here the PMAY – Housing for All seeks to address the challenge. However, the scheme could consider a rental model where needy persons will be eligible for renting homes, possibly with option to buy later. With this, people can move to different locations to access better livelihood options as well as seek out better/higher education for children.

As regards urban mobility the focus will remain on popularising public transport. While introduction of metro bodes well for many of our cities, the city bus could remain the main stay of affordable urban mass mobility (in Mumbai, the suburban train too). ULBs could look to transforming the reliability and effectiveness of bus services by involving private entrepreneurs to operate a fleet under the ULB banner. Such Air-conditioned services have become popular in some cities taking load off the streets and adding to sustainability. And above all, innovative measures are required to make mass public transport very affordable – cheaper than a motorcycle ride.

Promoting jobs and livelihoods will be an important part of the policy architecture of governments. While states try to attract industry through attractive taxation regimes, more needs to be done. Local governments could look at making their cities and towns attractive living destinations thus acting as magnets for attracting talent. Efficient public transport connecting the city with industrial hubs, and affordable, accessible housing could help attract investment and create jobs. Reliable power and water services could greatly help too.

In all their efforts to improve livability, ULBs will have to use citizen engagement, technology, and innovation in big measure. We need to do different things and do things differently to build cities of the future. ◼

"

The beautification of neglected spaces underneath flyovers, installing open gyms and different kinds of public art made from waste and scrap are measures with an aim to boost activities related to recycling

Anil Baijal
Lieutenant Governor, Delhi

"

Rain water and groundwater is which we need to conserve and use judiciously. Rainwater harvesting should be implemented universally. Through water audit, we have to ensure judicious utilisation of water resources, especially in urban areas

Nitishwar Kumar
Joint Secretary, Ministry of Jal Shakti, GoI

PIN POINT

"

Denmark , by comparison, is world champion in balancing huge amount of wind energy. However, 2020s will be the decade when we will really start to put the green power in use, and not least for production of green fuels such as hydrogen and ammonia

Jan Hylleberg
CEO, Wind Denmark

"

Australia's weather has always been variable. Last year to date I think both reflect the historical variability but with added components chucked in because of climate change, and that's generated temperatures well beyond what we have seen before

Mark Howden
Director, Climate Change Institute, ANU

BUZZ

Ministry of Power
Government of India
@MinOfPower

To promote usage of environment friendly EVs (Electric Vehicles) and making it more investment attractive, Ministry has issued revised guidelines and standards for "Charging infrastructure for Electric Vehicles". #PoweringIndia #EnergyEfficiency #YearThatWas

Durga Shanker Mishra
Secretary, MoHUA
@Secretary_MoHUA

We have made significant progress in the area of solid waste management with 60% of solid waste being processed & 96% wards practising door-to-door collection. We are fully committed towards making India Swachh & single use plastic free.

Antonio Guterres
Secretary General, United Nations
@antonioguterres

We cannot reduce poverty and inequality without addressing the world's most pervasive form of discrimination, affecting half of humanity: women and girls. We will only shift the balance when we truly see women's rights as our common goal

Inger Andersen
Executive Director, UNEP
@andersen_inger

Did you know that the carbon footprint of the use and production of cars in G7, China or India would decline by as much as 20% if one in four journeys in these countries was a shared ride? Drive less and #ActNow

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LEADERSPEAK
Citizens' participation in urban governance is fundamental to local governance as envisioned in the 74th Constitutional Amendment Act and also by the Father of the Nation Mahatma Gandhi whose 150th Birth Anniversary the world is celebrating. With the advent of technological advancements, governments can easily reach out to citizens and gather their inputs but processing and analysing of the humongous data still remain a challenge in order to take advantage of citizens' collective intelligence

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EQUI-CITY'S CONTRIBUTION TO SMART CITY PROGRESS

It may be mentioned that political development, democratic growth and administrative capabilities of a nation would depend largely upon the quality of 'leadership' at various levels namely, central, state and local. In fact, every organisation (governmental or otherwise), whether a political party or a group, needs high quality of 'leadership' at its core, to inspire and motivate as well as guide all its members in the collective pursuit towards their desired objectives. It is in such a context that the concept of 'leadership' has assumed much significance

The question of municipal leadership is of great significance in urban governance in India. There are various models of the position of leadership of an urban local body (ULB), predominantly tilting towards the 'strong mayor' model either through presidential system in the local body or through a 'mayor-in-council' system. In India, it is the 'state appointed municipal commissioner' model that holds sway.

A Leadership Workshop was conducted under the Equi-City Project in order to build capacities of elected representatives and municipal officials to play a leadership role in participatory forums and development of the city. The focus of this workshop was to hone the skills of municipal officials and elected representatives to act as leaders and to think innovatively and holistically about the challenges they face. It also worked to synergize between administrative and deliberative wing for performance improvement of the Corporation.

This Leadership Workshop on Smart City – Vision and Progress was organised under the Equi-City Project by All India Institute of Local Self-Government (AIILSG) along with Nagpur Municipal Corporation on December 13, 2019 at Hotel Centre Point, Nagpur. The Workshop commenced with an introductory speech by Ravi Ranjan Guru, Deputy Director General, AIILSG briefing the guests about the project timeline, work and achievements along the four years of the Equi-City Project. Shouvik Datta, Senior Programme Manager, European Union addressed the guests with a warm welcome and had an interactive session introducing the audience to the European Union and its past work and collaborations in different parts of India and the world.

Jayant Pathak gave a small introduction to the objectives of the Leadership Workshop and introduced the speakers to the guests. Further, the speakers were presented with

mementos followed by special remarks from Sandeep Joshi, Mayor, Nagpur and Abhjit Bhangar, Commissioner, NMC. The workshop was inaugurated by Sandeep Joshi along with Abhjit Bhangar. Manisha Kothe, Deputy Mayor, Nagpur and Ruling Party Leader were also present at the occasion along with Sandeep Jadhav, Opposition Party Leader, Tanaji Wanve, Regional Director, AIILSG, Nagpur, Jayant Pathak, Ashok Wankhade, Managing Editor, Urban Update, and Dr Amrita Anand, Project Head, Equi-City. The workshop saw large participation by around 54 elected representatives and 41 Nagpur Municipal Corporation officials.

The first technical session started with Mahesh Moroney, Deputy CEO, Nagpur Smart and Sustainable City Development Corporation Ltd who gave a brief presentation on the ongoing projects under Smart City Nagpur and explained its progress and current achievements. He explained the vision of Nagpur Smart City which is to e3i – To transform Nagpur into the most livable eco-friendly, edu-city

that electronically connects people with the government to create an inclusive ecosystem. He also explained various impactful projects under the Nagpur Smart City Proposal such as TenderSURE Concept for Area Based Development, Project Green Light which involved installation of LED lights in the Nagpur city, Nirmal Nag River Project and the Pan City Proposal which consists of city-wide solutions such as installation of fibre-based network connecting the entire city, smart kiosk terminals, accessible internet connectivity for general public, a regular city surveillance through CCTV cameras, mobile vehicles and drones.

Further in technical session Sulakshana Mahajan, former consultant at Mumbai Transformation Support Unit (MTSU) for urban planning, housing, transport and environmental issues related to Mumbai Metropolitan Region conducted a session on Global Smart Cities with special reference to Smart City project in India -Concept and Progress. She has conducted research and written about Indian

Inaugural ceremony of the Leadership Workshop on Smart Cities organised by the Equi-City team of the AIILSG

A group photo of the speakers, delegates and organisers at concluding ceremony of the Leadership Workshop

urban issues. Mahajan is also the author of various books on urban issues such as Jag Badalay! (2004), Arthasrushti, Bhav Ani Swabhav (2004) 'London Nama' (2010), 'Concrete chi Vanarai' (2013), 'Smart City–For All' (2016) and translated 'Cities for All' by Jan Gehl in Marathi as 'Asaavi Shahare Apuli Chaan'(2015), and 'SMART' by former Deputy Mayor of Barcelona, Spain as 'Tumhi Bi Ghada Na' (2019). She mentioned technology conversion all over the world in last 150 years and things which make a city smart like Safety and Security of citizens, particularly women, children and the elderly; Health and Education; Good Governance; Sustainable Environment;

Efficient Urban Mobility; Public Transport; Affordable Housing and various other factors. Mahajan also spoke about the smart cities like Amsterdam, Barcelona, Madrid, Columbus, Copenhagen and Singapore and discussed their major problems related to air quality, transport, solid waste, public safety, social problems and next generation innovation to solve these problems. She mentioned the concerns and challenges faced by developed and developing smart cities. The last session was conducted by Dr Kapil Chandrayan, Expert Member, Vidharbha Statutory Development Boardwho gave an insight on Smart Leaders for Smart City and what should

be the approach of leaders for Smart City Missions. He explained the elements of core infrastructure in a Smart City, various characteristics of a Good Leader and Leadership Qualities required for achieving the expected results. The Leadership Workshop concluded with a valedictory note by Ashok Wankhade. Wankhade presented his views on how the elected representatives and officials should work together for the betterment of the citizens and take ownership of the city by citing examples from Indore's performance in Swachh Bharat Mission. Finally, Jayant Pathak delivered the vote of thanks to all the participants, speakers and guests for attending the Leadership Workshop. ∎

OUR COLLECTIVE INTELLIGENCE WILL LEAD FUTURE OF CITIES

J ane Jacobs, the author of the famous book 'The Death and Life of Great American Cities' had once said, "Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody." This holds true even today. Information technology and access to fast internet on mobile phones have made it easier for the governments to reach out to citizens for seeking their suggestions on policies and projects.

Collective intelligence is not a new concept to any of us. Groups of people, including families, and business teams, do gather for taking decisions that concern all of them. Meetings in our offices and by a group of ministers in the governments are examples of this concept. Many studies suggest that collective intelligence is not just manifested by humans but also by groups of animals, swarms of insects and flocks of birds. They are capable of aggregating the information gleaned from individual group members to find food and nesting places.

BIG DATA FOR BETTER DECISIONS

Now the contours of data collection have also changed drastically with the introduction of the Internet of Things (IoT) and Big Data concepts. Governments need not ask citizens to make feasible projects and programs. Under Smart Cities Mission, many Indian cities have begun using Big Data and information technology for managing urban assets such as public transit systems, wastewater systems, roads, parks, and so on. Under this concept, a host of physical assets of a city system are connected to the IoT via sensor technology with these sensors generating streams of valuable data: water consumption patterns, travel patterns, use of parking facilities in cities, etc.

This has become possible because of our access to connected devices. Most of the activities in city systems can be digitally captured. Any action on a connected city system leaves a

Citizens' participation in urban governance is fundamental to local governance as envisioned in the 74th Constitutional Amendment Act and also by the Father of the Nation Mahatma Gandhi whose 150th Birth Anniversary the world is celebrating. With the advent of technological advancements, governments can easily reach out to citizens and gather their inputs but processing and analysing of the humongous data still remain a challenge in order to take advantage of citizens' collective intelligence

digital footprint and it enables cities to have access to citizens' preferences, behaviours that can be analysed to create recommendations for making informed decisions. For example, a smart parking system in a city centre can tell us the requirement of parking spots at each hour of the day. This can help city governments in managing parking facility and diverting vehicles to another parking facility nearby without creating traffic problems to commuters.

According to the definition by a provider of a smart parking facility, it is a parking solution that can include in-ground Smart Parking sensors, cameras or counting sensors. These devices are usually embedded into parking spots to detect whether parking bays are free or occupied. This happens through real-time data collection. The data is then transmitted to a smart parking mobile application, which communicates the availability to its users. Some companies also offer other in-app information, such as parking prices and locations. This gives citizens the possibility to explore every parking option available nearby. Such innovation is not just

limited to smart parking systems but the arena of possibilities is immense.

Similarly, city officials in Boston, USA targeted restaurants for inspections for food safety violations based on reviews of citizens on a food review website. Usually, health officers do random checking of restaurants but the access to data on the website helped to zero in on their target restaurants. The sharing of data became two-way, health officers also made their report public for users to make better decisions before choosing a restaurant because now they were aware which restaurants had flouted norms in the past and have been penalised for the same.

SUCCESSFUL STRATEGY

Citizens and start-ups can come forward to help local governments process and analyse citizen contributions. Innovations from citizens can help in easing analysis and save governments both time and money but for this, the governments need to open data for the public with reasonable restrictions. This would help municipal governments tap into the collective intelligence of citizens and make

RANJIT S CHAVAN
President, AIILSG

better decisions based on their inputs. This, in turn, could increase trust in public decision-making and encourage dialogue between governments and their citizens.

Citizens no longer want to remain passive in the development process of their cities. They want to engage in effective ways in the process of redefining their cities. Bluenove, a technology and consulting company that pioneers massive collective intelligence and is actively committed to civic tech, developed a platform called Assembl. It is a tool for massive-scale, digital collective intelligence which was used by the City of Paris to engage residents in the development of the "Smart City to 2020 and beyond" strategic plan. It takes up a key issue, initiates a discussion about it with thousands of people and helps co-create a deliverable within two months that has been put together by all of the participants. The deliverable can be an action plan, a series of projects, a manifesto or a set of recommendations. The platform uses the forum feature which is based on Artificial Intelligence (AI), but everything is managed with human intervention.

With "Madame la Maire, j'aiune idea" (Madame Mayor, I have an idea), the Paris City Hall has a web platform where Parisians can publish on subjects as diverse as sports in Paris in 2024. More than 22,000 people have signed up for what is called an ideation platform, a great idea box in the age of the Web. Such platform takes into account the suggestions of the citizens on various subjects and they can help the governments in making informed decisions for the benefit of a city.

These kinds of innovative technologies provide the leeway for a democratic process of collective decision making. This is for sure that when citizens participate in the decision making process, city officials and elected representatives will be surprised by the extent of innovation that arises out from the collective intelligence of our citizens. ■

REFORMING INDIA'S URBAN GOVERNANCE
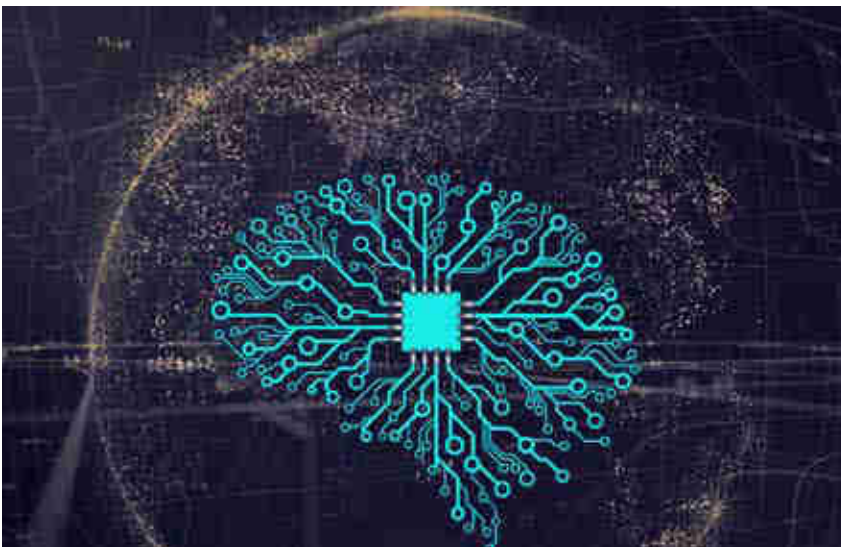
A s urban India's population surges, there is concern that any one of the many challenges - affordable housing supply, congested roads, limited water, and sanitation services - will amplify and undermine India's economic growth. To meet the challenges of this inevitable urbanisation, India needs well-performing cities. While cities in India are filled with vibrant activity and energy, they are also chaotic, complicated, and too often congested.

Recent global policy discourses orchestrated under the aegis of the United Nations, such as the Agenda for Sustainable Development (2030), the Paris Agreement, the Quito Protocol and the New Urban Agenda all stress upon the need for concerted focus at the city and the community scale – not only to achieve long term developmental objectives, but also to make direct tangible benefits to the quality of lives of the people. With poverty reduction as the overarching vision, the Sustainable Development Agenda has identified 17 Sustainable Development Goals (SDGs) by building upon the earlier set of Millennium Development Goals (MDGs).

Despite successes achieved by

India needs to create opportunities for cities and towns to grow and become vibrant centres of investment and productivity. This requires amendment of 74th Constitution Amendment Act and certain administrative measures such as provision of a minimum level of municipal staff, improved finances and incentives for active participation of citizens

many local governments in improving infrastructure services, India's real challenge is replicating and sustaining these innovations on a large scale. Recognising the fact that Urban Development is a State subject states are looking at ways of sustaining and building upon the current reform agenda and scale up pilots that have

started showing results at city level, so that tangible results become widely institutionalised, and fully embedded into the local system. The emerging challenge in institutionalising and scaling up these efforts, assuring that governance structures are credible and effective, recognising capacity challenges for coordination and

HITESH VAIDYA
Director, NIUA, New Delhi

CHETAN VAIDYA
Former Director, SPA, New Delhi

THE MAYOR SHOULD BE THE CHIEF EXECUTIVE OF THE MUNICIPAL BODY WHILE THE COMMISSIONER SHOULD PERFORM THE ALLOCATED DUTIES. ELECTIONS TO ULBS SHOULD NOT BE, GENERALLY, DELAYED BEYOND SIX MONTHS. INCENTIVES SHOULD BE PROVIDED FOR INCREASING CITIZENS' PARTICIPATION AT AREA SABHA, WARD COMMITTEE, AND ZONAL COMMITTEE LEVELS IN ULBS

collaboration, bringing efficiency in service delivery and financing requires a continuous effort over the long term to encourage and sustain change.

Urban expansion is inevitable. The vision draft National Urban Policy Framework 2018 is to see cities as complex and changing agglomerations of people who are constantly interacting with each other, with socio-economic institutions and with the built environment. The soft and hard infrastructure of the city provides the backdrop for such interaction and are not ends in themselves. The exact optimisation of a specific city, therefore, depends crucially on local context and local governance issues.

In order to address urban challenges GoI has taken various initiatives and flagship missions. The focus of all the missions was to make the city work and ensure that both today's and tomorrow's needs are met. However, all these missions have been centrally driven. The problem with the traditional, centralised development model and experimentation is that cities are becoming dependent on central funding without developing institutional mechanisms at local level to address urban challenges. One of the major lessons learned based on missions is that transformation requires renewed efforts and to revisit business models of engagements with cities. This calls for a significant shift that is necessary to ensure that the underlying governance principles of participation, decentralisation, autonomy, and accountability of representative urban local governments are kept in view.

The 74th Constitution Amendment Act (CAA) which came into force in June, 1993 was a step envisaged to empower the Urban Local Bodies (ULBs) and strengthen urban decentralisation. While the constitutional amendment laid down a roadmap for decentralisation and greater devolution of power at the state and local levels, the implementation is slow and yet to take roots, implementation of CAA has raised many issues in order to deliver the 21st century solutions. These are discussed in next sections and it is followed by certain recommendations.

ISSUES

In most states, Mayors do not have executive powers as they are vested with the Commissioners. There are some exceptions such as Kerala where Mayor has some executive powers. In contrast to this, the New York City has a strong 'mayor-council' system and fully empowers the Mayor with executive powers.

The 74th CAA provides a framework to enable participation of citizens in urban governance. It contains an enabling mechanism to form wards committees for citizens' participation. Concept of Area Sabha was introduced to promote a sense of belongingness, inclusion and participation in working of ULBs. However, it has remained on paper in most states. In contrast, South Africa has clear policies for local governments to build partnership with community organisations and encourage citizen participation. Indian cities have many agencies providing urban services such as municipal corporation, water supply and sewerage board, and urban development authority, and these agencies, generally, do not work in an integrated manner.

Citizens, often, do not know whom to approach for civic problems. However, in Metropolitan London, the boroughs (municipalities) are responsible for civic administration. The Mayor drives key citywide strategic functions. Similarly, in the city of Seoul, multi-disciplinary urban renewal is driven by a strong leader in the heart of the city by leveraging stakeholder conflict, effective civic personal collaboration, and public engagement.

As per 74th CAA, state governments have set up State Finance Commissions (SFCs). Most SFCs have formulated the fiscal packages without access to a clear directive on the functional jurisdiction of municipalities. With amendment of Article 280 in 1992, the Central Finance Commission (CFC) have to address the issue of municipal finances. CFC grants are not sufficient for managing urban areas.

Most ULBs in India do not have the capacity to promote cities as 'engines of growth'. The local agencies have weak institutional capacity to plan spatial, social and economic development, have unstable revenue streams, and low capacity to plan, mobilise resources, and implement urban infrastructure projects.

The ULBs are not in charge of planning for 'economic development and social justice' and implementation of city/town development plans due to failure of state governments to amend State Acts. Further, Metropolitan Planning Committees (MPCs) and District Planning Committees (DPCs) have not been assigned a clear role in preparation of regional and urban plans. The 74th CAA has mandated the State Governments to constitute MPCs and DPCs, which are responsible for the preparation of Metropolitan Plan and District Development Plan.

In the Constitution of India, there is no "municipal finance list" to match the municipal functions. Further the 74th CAA is not specific about the types of taxes ULBs should have but on the other hand the powers for determining the revenue base of ULBs rests with the state governments. ULBs revenue bases are limited and inflexible.

SUGGESTIONS

To improve urban governance and delivery of services there should be constitutional amendments as well administrative actions. These are:

CONSTITUTIONAL AMENDMENTS

The 12th Schedule of the Constitution should be amended and classify the functions into core, assigned by government and others functions. Sub-section (a) (ii) in Article 243-W should be amended so that ULBs should be accountable for provisions of core services in 12th Schedule. The term 'may' in the sub-section should be replaced by 'shall' for core functions. The services may be provided by the ULBs directly or indirectly through parastatals or outside agencies. Article 243-Q should be amended so that industrial areas are not exempted from formation of ULBs. Article 280 deals with CFCs. The sub-section 3(c) in this article should be amended so that CFCs provide grant-in-aid to ULBs linked to net proceeds of taxes (and not ad-hoc grants). There should be 'municipal finance list' in the Constitution to match the municipal finances to its functions.

MANAGEMENT ACTIONS

To strengthen ULBs, a minimum level of staffing should be provided for them. The Mayor should be the Chief Executive of the municipal body while the Commissioner should perform the functions delegated to him/her. Elections to ULBs should not be, generally, delayed beyond six months. Incentives should be provided for increasing citizens' participation at area sabha, ward committee, and zonal committee levels in ULBs.

To provide financial support to ULBs, SFCs should be constituted every fifth year. The SFCs should submit their reports in time to be considered by CFC. Common formats must be adopted, and annual accounts and other data must be compiled and updated for use by the SFCs. SFCs should identify taxes, user charges and fees to be levied by ULBs.

As far as planning is concerned, MPC/DPCs need to coordinate with various agencies with regard to implementation of various programmes. The programmes need to be prioritised as per the Plans. Management of water supply and sewerage system should be the primary function of ULBs. They should be given responsibility for water supply and distribution in their territorial jurisdictions whether based on their own source or on collaborative arrangements with parastatal and other service providers. Parastatal agencies should be accountable to ULBs.

Moreover, the Model Municipal Law developed by the Government of India (GoI) in 2003 should be reviewed and revised.

CONCLUSION

Creating opportunities for cities and towns to grow and become vibrant centres of investment and productivity is, therefore, quite crucial in transforming the nation. The 74th CAA has led to regular elections of ULBs, reservation of seats and constitution of SFC. However, urban governance in India needs further strengthening through amendment of 74th CAA and certain administrative measures such as provision of a minimum level of municipal staff, improved finances and incentives for active participation of citizens. ◼

INNOVATION CAN BE A KEY ENABLER OF BETTER CITIES

Cities around the world are grappling with issues of livability, more so in the developing world. As new challenges crop up with regularity, the old challenges of housing, mobility, waste management, etc. have grown to menacing proportions drawing responses that are characterised by 'more of the same'. Rather than getting caged in our past experiences, we need to do things differently or to do different things

Insanity is doing the same thing over and over again and expecting different results'. This quote is attributed to the great Albert Einstein and he should have known. But we continue to do the insane; many of us in our day-to-day lives.

Similarly the approach to our cities' problems is marked by the 'more of the same' approach. As we look around, we can see how evident it is. Take mobility for instance. Cities have responded to the challenge of growing congestion by building more roads, wider roads, more flyovers and viaducts, more parking, and so on. This is not to say that these do not help. Rather to say that these amount to incrementalism - tinkering at the margins while what is required is transformative intervention that can bring about breakthroughs. Or take the case of solid waste management. Approaches include identifying more landfill sites, setting up more intermediate waste distribution centres, providing more bins to households – again more of the same. These too are required and do help. But these cannot prevent the onslaught of waste that will drown us soon.

INCREMENTAL AND BREAKTHROUGHS

If there is one word that can become the central approach to meeting our cities' challenges, that must be 'innovation'. There is need to build innovation in all we do in our daily lives as well as what policy makers do – individually and collectively – to make things better. While we must not cast aside the potential of small improvements (incrementally better) in our search for breakthroughs, the attempt must be on making a significant difference. In other words, constantly make incremental improvements, while looking for breakthrough opportunities.

The following could be an example. We know that recharging of batteries is a nagging issue plaguing the electric mobility sector. Therefore technology leaders and urban planners are working constantly to increase the range of each charge, reduce the time required to

charge fully, increasing the number of charging stations, and so on. These will continue as part of the incremental improvement programme. However, if we were to work out a system where one just exchanged a charged battery for a drained out one, to be strapped on within ten minutes, this practice could provide a breakthrough solution to the electric mobility puzzle.

In the area of mobility again, while cities constantly upgrade and augment roads and other such physical infrastructure, we have made very little progress on water based mobility. Coastal and non-coastal (inland waterways) cities both offer opportunities in this area. There has been talk on and off about developing catamaran/boat based public transport including in the city of Mumbai; also a proposal to develop a vehicle that can travel both on road and water. As of now there is not much to show, atleast not with any big impact.

But such water-based mobility offers good scope to decongest roads and provide a speedy travel option for citizens. One needs to think through issues of access, scheduling, safety, pricing/affordability, etc. using innovation.

WASTE MANAGEMENT

As we noted earlier, waste management effort is concentrated around better and greater segregation, distributing more bins to households, building newer landfills, augmenting fleets to carry the waste, etc. These are all primed towards managing the humongous, growing quantity of waste that gets generated each day. All these actions form the incremental part of the waste management exercise. While these are required, such efforts will not prevent us from drowning under mountains of waste in the years to come; or from the issues of pollution of land, water and air; and public health issues of great proportion. What is required alongside is elimination of waste.

Take the example of the humble toothpaste, an item of everyday use for each one of us on this planet. Each tube comes in a paperboard pack which we promptly dispose of on opening. Each day, millions of such card paper packs get thrown away to end up in landfills. Can we pack toothpaste and other such commodities (cosmetics, shaving creams, etc.) differently so that no card paper packs are used? Take the case of medicines – tablets and capsules – that usually come in blister packs.

UNCTAD: Technology & Innovation Report 2018

THE 2030 AGENDA for Sustainable Development Goals sets ambitious targets across economic, social, and environmental measures in order to fulfil the ambitions of mankind, and enable improved quality of life for each individual. The SDGs demand unprecedented efforts to result in measurable outcomes in each of the goals and their targets.

The United Nations Conference on Trade and Development (UNCTAD) Technology and Innovation Report 2018 outlines that use of frontline technologies and developing innovations, including non-technological and social innovations could be transformative in achieving the sustainable development goals and producing more prosperous, sustainable, healthy and inclusive societies. The widespread use of ICTs and Renewable Energy are quoted as examples of the transformative effects for sustainable development especially in developing economies. Big Data, Internet of Things (IoT), Artificial Intelligence (AI), 3D Printing, Biotechnology and Nanotechnology are mentioned as frontier technologies which can have big impacts. These, often used jointly with each other have the potential for transformative improvements in the areas of healthcare, education, construction, energy, waste treatment, water management, agriculture, medicine and the environment.

The Report however cautions about the link between technology and employment, noting that while some jobs get eliminated, others get created; the net impact remains ambiguous. 'There are also signs that the net impacts may be most unfavourable for women', the report says. Simultaneously it draws attention to the concerns of citizen's rights, privacy, data ownership and online security and highlights the need for effective institutional frameworks and regulatory regimes for data collection, use and access. Another concern expressed is the disparity among the developed and developing economies on the technology front, with respect to the amounts of research and development expenditure both in absolute terms and in relation to GDP, and the numbers of researchers. It notes that the share of developed economies is disproportionately high.
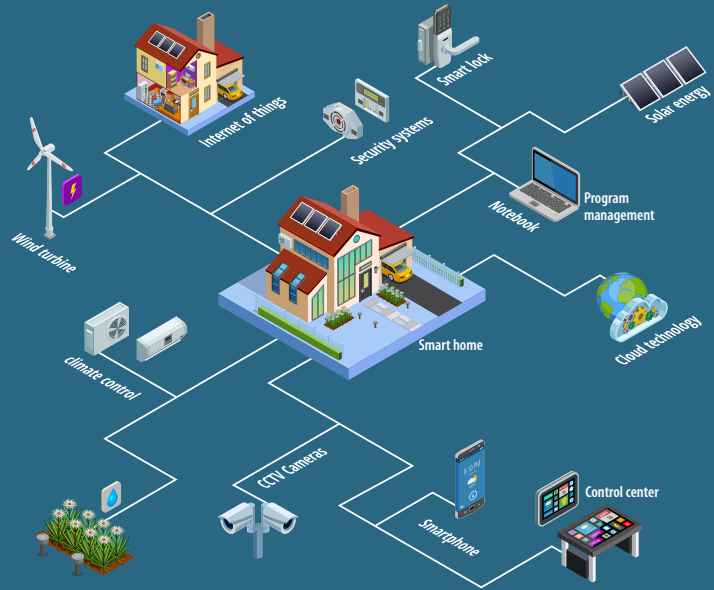
Speaking about complementary human skills to benefit from technology, there is mention of behavioural, interpersonal and socio-emotional skills, creativity, intuition, imagination, curiosity, risk-taking, open-mindedness, logical thinking, problem-solving, decision-making, empathy and emotional intelligence, communication, persuasion and negotiation skills, networking and teamwork, and the capacity to adapt and learn new abilities – skills that are difficult for robots and machines to emulate. Therefore there is a need to match the supply of skills in these areas to rapidly evolving technologies. This calls for agility in education policies, and may mean transforming education and training systems. There are signs that educational institutions are not keeping pace as expected, giving rise to shortage in skills, especially in digital technologies, the report warns. That women are highly underrepresented in the technology domain, especially digital technologies sector is a major cause for concern and this can serve to perpetuate existing divides. Therefore it calls for policy intervention.

In further discussions there is a detailed mention of supporting measures for innovation such as financing mechanisms and policy coherence, and for redirecting the innovation towards inclusiveness and sustainability.

Source: https://unctad.org/en/PublicationsLibrary/tir2018overview_en.pdf

V VIJAY KUMAR
Senior Advisor, AIILSG

> IN THE AREA OF MOBILITY AGAIN, WHILE CITIES CONSTANTLY UPGRADE AND AUGMENT ROADS AND OTHER SUCH PHYSICAL INFRASTRUCTURE, WE HAVE MADE VERY LITTLE PROGRESS ON WATER BASED MOBILITY. COASTAL AND NON-COASTAL (INLAND WATERWAYS) CITIES BOTH OFFER OPPORTUNITIES IN THIS AREA

Sometimes, these are again packed in a card paper carton which we simply throw away. Yes we also throw away the blister packs.

Can this be avoided? Yet among the biggest waste problems is polystyrene (also called Thermocol). It is extensively used in packaging as it is light, can be moulded into specific shapes, and is above all, inexpensive. It however has damaging effects on the environment and is therefore banned in some forms in many states. While recycling Polystyrene is technically possible, no one cares to do it since it costs so little; so used material ends up in landfills and oceans. An alternate, more environmentally benign material (straw for packaging) can add very greatly to waste management and sustainability.

And what about clothing? The waste being generated out of used clothing is turning out to be a big headache for the whole world. It is exacerbated by the trend of 'Fast Fashion', of rapidly changing fashion and preferences. The value lost due to premature disposal, i.e., under-utilisation, of clothing is by some estimates, about US$500 billion annually. At the same time it impacts the environment hugely. And what

about similar household items like mattresses and cushions which we replace once every few years. No one knows what to do with the old ones. The seller of the new mattress takes it away as part of the deal and just dumps it in the nearest stream, river or vacant land. Innovation will become an indispensable lever in our efforts to reuse, recycle and upcycle used clothing and such material.

Extended Producer Responsibility (EPR) has been talked about since long and needs to be taken up enthusiastically. Participation and active support of the producers must be sought in our efforts to build cleaner, safer cities. For example, manufacturers of FMCGs - cosmetics, personal care products and pharmaceuticals – are highly innovative when it comes to designing, manufacturing and promoting their products. Surely they can be encouraged to design and implement appropriate systems to ensure that used packaging (often plastic) is collected and safely recycled.

SERVICE DELIVERY AND HOUSING

As regards service delivery in our cities, technology could come to our

aid in improving outcomes and citizen satisfaction. Water supply especially is amenable to several possibilities including individual home level metering. ULBs which approve new building plans could ensure that atleast new buildings have individual meters for water supply. Metering and billing for water consumption at household level is vital to ensure judicious use of rapidly depleting resource. Dual piping for drinking and for other purposes is urgently needed too.

Affordable housing has proven to be a stubborn challenge. We need to house the millions of our urban poor in an equitable and sustainable manner. Yet owning a house seems increasingly difficult for city dwellers. What about renting a house, then? Rents could be brought down with lower capital costs. What about using different materials for constriction – demolition waste, recycled metal and plastic, agri-waste (prevent its burning)? Must houses be built to last 50 or 100 years? The answers to affordable housing may lie in the answers to these questions.

Innovation is a result of deliberate, conscious, rigorous effort; not sitting still waiting for the flash in the pan 'Eureka' moment to strike. ∎

BHUBANESWAR NEEDS TO ACT FAST TO ACHIEVE SUSTAINABILITY

Bhubaneswar, set to transform into a smart city, is facing cyclonic storms and experiencing extreme weather events more frequently than a few decades ago, city dwellers observe

According to experts, the state was hit by about 110 cyclones between 1891 and 2018. In 2019 alone, Bhubaneswar was badly hit by the very severe cyclonic storm Fani and narrowly escaped the wrath of another cyclonic storm Bulbul.

Placing temperature rise as the major culprit, climate science researchers believe that the city may have to see a harsher future. A study by the Climate Impact Lab in collaboration with the Tata Centre for Development at UChicago projects that the number of extremely hot days in the state is projected to increase 30 times from 1.62 in 2010 to 48.05 by 2100 in the absence of strong measures to control temperature rise.

Urging for a coherent strategy on building climate resilience across sectors and communities to limit the threat climate change and extreme weather events pose, the study has projected that Odisha could see a 3.32°C rise in average summer temperature from 28.87°C in 2010 to 32.19°C by 2100. While the state may have to see 42,334 excess climate-related deaths due to increase in temperature, "Its capital city, Bhubaneswar, may have to face the brunt of temperature rise," said Amir Jina, one of the researchers.

Another research conducted by experts from Indian Institute of Technology (IIT) Bhubaneswar and University of Southampton (UK) has found that rapid urbanisation combined with changes in land use pattern has led to about 1.8°C warming of Bhubaneswar, compared with surrounding non-urban areas, and caused urban heat island (UHI) effect. Tracing the reasons behind temperature rise in the city, the research notes that the rate of urbanisation being 83 per cent in past 15 years, changes in LULC (Land Use Land Cover) aggregates to a massive decrease of about 89 per cent and 83 per cent in dense vegetation and crop fields respectively during the reference period leading to UHI effect.

THREATS FROM HEAT STRESS

As the trend goes, experts believe, such hot summer days and heat waves are set to become more common. Scientists apprehend that continued urbanisation will place more people in the cities vulnerable to urban heat island (UHI) effect, which can raise air temperatures by several degrees Celsius. As a result, extreme heat is poised to become one of the most significant and directly observable impacts of climate change in the coming decades.

According to assessments made in a report on increasing probability of mortality during Indian heat waves, published in the magazine Science Advances, heat wave days and the mean duration of heat waves have increased by approximately 25 per cent in the majority of India while parts of the country have experienced 50 per cent more heat wave events. Apprehending substantial increase in mortality rates due to either 0.5°C increase in summer mean temperature or to more heat wave days, the report warns that future climate warming could have a relatively drastic human toll in India and similarly in developing tropical and subtropical countries.

IPCC's (Intergovernmental Panel on Climate Change) fifth assessment report highlights that the last three decades in India were successively warmer. The changes in the climate patterns often lead to extreme temperatures and precipitation, drought, and other calamities.

Undergoing a transitional phase to become a smart city by virtue of new buildings and infrastructure for better services to its dwellers, the pertinent question is whether Bhubaneswar and its existing infrastructure are capable of withstanding the increasing heat stress under the influence of rising temperature and changing climate.

Impact of climate change being widely felt across Odisha, talking about its possible impact on Bhubaneswar has become very important as it may lead to high economic burden and deficient service provisions making life miserable, Mayarani Praharaj of College of Engineering and Technology (CET) pointed out.

ECONOMIC FALLOUT

Recent extreme weather events reveal the vulnerability of the built environment (infrastructure such as residential and commercial buildings, transportation, communications, energy, water systems, parks, streets, and landscaping) and its importance to how people live, study, recreate, and work, cautions the NCA4 reports on built environment, urban systems and cities. Similar are the projections made in IPCC's fifth assessment report.

More specifically, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national science research agency, warns that a changing climate including chronic factors like

BASUDEV MAHAPATRA
Senior Journalist

INDIAN CITIES ARE KEY ELEMENTS OF THE ECONOMIC TRANSFORMATION THAT IS BEING ENVISAGED BY THE GOVERNMENT OF INDIA. THE CHALLENGE BEFORE THE COUNTRY IS TO MAKE A DRASTIC SHIFT FROM AN AGRICULTURE-BASED ECONOMY TOWARDS A MANUFACTURING AND SERVICES ECONOMY THAT CAN PROVIDE SUSTAINABLE LIVELIHOODS FOR THE INDIAN POPULATION

temperature and humidity as well as acute factors like extreme weather events will alter environmental conditions concrete is exposed to, particularly over the relatively long lifetime of most structures. This means that the concrete deterioration rate will increase with implications for the safety, serviceability and durability of infrastructure.

An Asian Development Bank (ADB) report says that countries of Asia will be among the worst affected by rising temperatures, extreme weather patterns and floods caused by climate change. The development bank of the region has subsequently claimed that it has since 2013 screened its investments for climate change implications, asking questions such as whether new cities, bridges and roads will be able to cope with more severe flooding and other threats.

Odisha, which has already been experiencing the effects of climate change and extreme weather conditions, the urban centres are vulnerable to natural hazards like cyclone, heat wave, urban flood, health, and earthquake, according to the Odisha State Action Plan on Climate Change for the period of 2018-2023. Rising temperatures and extended heat wave periods expedite damage to roads and pavements. Higher temperatures also affect rail networks through thermal expansion, the action plan confirms. The magnitude of the damages caused by cyclonic storms induced by rising temperatures is too high. Odisha

government's damage assessment report on cyclone Fani estimated the total damage and loss at ₹24,176 crore. Even though mildly affected by cyclone Bulbul, the damage was proportionately high as an estimated 200,000 hectares of crops were damaged across the state. West Bengal which was hit by Bulbul had to suffer damage and loss of about ₹23800 crore.

ACT FAST

"Indian cities are key elements of the economic transformation that is being envisaged by the Government of India. The challenge before the country is to make a drastic shift from an agriculture-based economy towards a manufacturing and services economy that can provide sustainable livelihoods for the Indian population," says the Urban Green Growth Strategies for Indian Cities (Vol 1). It's also projected that two-thirds of the world's population will live in cities by 2050.

Therefore, as highlighted in the Urban Green Growth Strategies for Indian Cities, there is a desperate need for new policies and implementation of strategies that can generate positive social, environmental and economic impact. Without a radical change in the 'business as usual' paradigms, Indian cities will continue to achieve limited growth at the cost of very high resource consumption, which is unsustainable. The UN-Habitat guidelines also emphasise that environmental sustainability, equity and social inclusion, availability of infrastructure,

productivity and quality of life are necessary for creating prosperity.

Bhubaneswar Smart City authorities and planners need to integrate climate change while planning new projects, opined Ramesh Swain, leading architect and town planner of the city. He however, doesn't see heat wave events, increasing temperature and humidity as immediate threats to the city's infrastructure.

Rising temperature may pose bigger threats to our infrastructure in the second half of this century, says Uma Charan Mohanty, visiting professor to the School of Earth, Ocean and Climate Sciences at IIT Bhubaneswar.

City based architect Sagar Mohapatra observes, "With the land surface of the city transforming into a concrete floor and the green cover being squeezed rapidly, the crisis we talk about may come sooner than our expectations if the city doesn't wake up to these issues and act promptly."

While the climate smart cities project attempts to anchor climate-friendly solutions, the other project aims to improve the planning processes and the implementation of sustainable and integrated urban transport systems and solutions. However, according to sources at BSCL, it isat an initial stage, and there is still a long way to go on climate change action.

At present, urban planners and administrators must understand that we need to act fast as delay may prove to be more dangerous increasing the burden on the city. ■

ENVISIONING INDIAN CITIES OF NEXT DECADE

The idea of the urban is that of human imagination, of progress and growth, of scientific advancement and an aspirational life. The city is then, subject to constant re-imagination. This decade will decide the future of Indian cities

ndia's unique urbanisation opportunity is jeopardised by severe gaps in urban public infrastructure, services and capacities, the consequences of which are witnessed in our cities every day. The urban vision for the Indian city must project the aspirations of citizens, including the most marginalised while also rapidly building responses to the future. I wish to frame India's multifold urban challenge as three distinct features, to derive better actionable points for us as citizens, civil society, planners and policy makers.

♦ Cities are emerging as poverty concentrations and exclusions – The ever increasing cities, though contributing to economic growth, will further become 'pockets of poverty' and increased inequality. While urban poverty – in income and other indicators - has declined considerably, there are distinct spatial concentrations and differences within the cities itself. The cities and the multiple exclusions are further reinforced by the informal settlements and habitations of urban poor being ignored from the city planning, thereby called 'Black holes' of urban planning, leading to differential levels of access to municipal services and 'absence' of urban governance institutions. In the coming decade, the policies that monetise urban land will lead to further spatial cleansing of urban poor – worker populations to the margins, as is visible with evictions and displacements that have become a new normal of the Indian cities. Informal urbanisation will take over the peripheries, infringing into the rural hinterlands catering to the recent migrants who have not found space in the city centers. Ticking off rural and urban contestations. And yet new forms of marginalities will emerge, that will replace the existing urban deprived groups, with a lower-middle-class urban poor or a 'neo-urban poor'; who might be better paid, but find their livelihoods equally vulnerable.

Going forward, cities in this context of Climate Crisis are also witnessing the marginal populations unable to cope with its impacts. Furthering the precariat and threatening their location in the city.

♦ Cities as unlivable and unsustainable - In contradiction to the pull of cities, most Indian cities will increasingly turn unlivable by 2030. Indian cities will emerge as significant contributors to pollution, climate change and disasters in the urban, and vulnerabilities will increase. Indian cities have already borne the brunt of climate change recently in the form of urban floods, poor air quality and heatwaves. The state response has been ad-hoc solutions, with very less correlation with how our cities are designed and planned. Cities of the future would significantly impact emission profile, playing a huge role in bringing about sustainable and resilient development. Also, in the coming decade access to resources that were taken for granted like water, air and food will be severely restricted due to the present unsustainable practices and improper planning. Urbanisation in India, until now has been viewed as contrary to environmental objectives. This altered scenario is the biggest opportunity and challenge to advocate for a sustainable form of urbanisation that is more equitable and harmonious to environmental goals, with climate justice for urban poor groups at its center.

♦ Cities in need of urban planning and local governance - After more than 25 years of urban governance in India, the cities are still in dire need for basic institutional structures and capacities. The 10,000+ (or more) cities will be unmanageable as the local governments will lack capacities and means to engage with urban planning and issues of governance. This scenario can only get worse with higher population concentrations unless city governments are empowered. The recent policy prescriptions for urban-centric programs further 're-centralise' the urban governance process. Lack of decentralisation of funds, people's awareness, especially the marginalised sections, further complicates matters at the level of local. Also, to address the climate crisis effectively, decentralisation and people's participation is critical, as sustainable change will only happen if it is ground up and encouraged through a governance framework.

PROPOSING A VISION FOR 'SUSAINABLE' INDIAN CITIES IN 2030

Looking at the above mentioned three forked challenges of Inclusivity, Sustainability and Participatory Urban Governance, the only solution for us is to go back to the basics of cities and their imagination as democratic participatory urbans. This also presents us with the opportunity of re-writing this imagination of our cities more

ARAVIND UNNI
Urban Poverty—Thematic Lead
Indo-Global Social Service Society

collectively and from ground – up. In such an attempt at re-imagining our cities for the coming decade, as an urban practitioner and member of a civil society organisation, we posit a vision for the Indian cities in 2030. The vision is of: 1. Cities with Dignity and Inclusivity for All, 2. Sustainable, Self-Reliant and Low Carbon Cities and 3. Cities as Democratic, Participatory institutions. The details of which are as follows –

Cities with dignity and inclusivity for all – it is expected that our cities are inclusive to all, and at the bare minimum provide, access to all for adequate, safe and affordable housing and basic services. Other than the housing needs, inclusion to safe, secure livelihoods – especially of informal and reinforcing the formal sector should be encouraged - leading to dignified living standards. Cities also need to be looked through a prism of health, and inclusivity also translates into cities with adequate health services and with spaces for healthy living. As a departure from the existing, our cities have to be free of violence, and deaths of the marginal groups like homeless, safai karamcharis and other informal sector workers. Cities should be without discriminatory practices as ghettoisation and segregation of communities according to race, ethnicity, caste or religion. Also, finally to ensure special attention to the needs of those in vulnerable situations - women, children, transgender, persons with disabilities and aged population. In sum, we should aspire for cities that value human rights and translate that into planning and infrastructure

ensuring material gains for the weakest – urban deprived populations.

Cities as self-reliant, resilient and low carbon - by 2030, Indian cities should be imagined as self-sufficient and reliant by themselves. As opposed to the energy – resource guzzling mega systems, the city and its people will have to develop sustainable consumption practices, within and in relation to its hinterlands. Thereby, ensuring that there is a strict movement of discourse towards what we produce and consume within our city and its wider region.

Cities, as a continuation of self-reliance, should be imagined to leave low carbon footprints with special care to protection of resources like air, water and generating no waste. Simple acts of designing and planning for at the human scale will make the cities livable, with built form that is suited to live, work and play characteristics. In the coming ten years cities will also encounter many urban disasters that await us. All that we build might be destroyed if we are not prepared and adopt resilient practices to adapt, enable our capacities to mitigate the impending challenges.

Cities as democratic and participatory institutions – lastly, but most importantly, we shall aspire to have cities with participatory, integrated and sustainable urban planning mechanisms, where urban planning – in the form of master plans and further devolved to local area plans – is participatory and people led. As only institutionalised participatory planning can ensure inclusivity and sustainability of our cities in the long term. This needs

to be strengthened by transparent, decentralised and participatory urban governance mechanisms that ensure that every citizen – including children and youth – have their say in the making and decision of their cities. This could be ensured by participatory planning and budgetary process at the local level that build ownership and responsibility of people towards its cities. Such democratisation in running of cities will require institutional capacities, people's capacities and willingness of local bodies to develop shared knowledge and information sharing mechanisms to aid in the process of democratizing city – making.

CONCLUSION

Cities across the globe are vehicles of growth and development, concentrations of wealth and symbolic of the 'good life'. The vision for the urban must be deeply rooted in values and beliefs which shall motivate and guide every imagination of the urban- of how the State approaches the city, how the planner puts it on paper and the ways in which common citizens, women, children and all others live the urban.

The urban in India is a legacy of hope and social change - of Ambedkar's city as a space of emancipation and Gandhi's city driven by sustainability and self-governance. While stalwarts may guide, the urban is also a space of everyday resistance, the palpable hope that change is inevitable. It must be envisaged as an opportunity for equality, for growth, for emancipation and endless opportunities for all. ◾

MATTHIAS HELBLE
Economist, Economic Research and
Regional Cooperation Department, ADB

HOUSING UNAFFORDABILITY CRISIS IN ASIA

The poor and middle class are struggling to find affordable housing across the region, but there are some basic steps cities can take to improve the situation. Cities in developing countries all over Asia face a severe housing unaffordability crisis. Prices as a portion of income have reached levels that prevent most urban dwellers from realizing their dream of becoming a homeowner. And as cities continue to grow, that does not look set to change.

The consequences of the housing unaffordability crisis go beyond the individual household though and impact the entire economy. As housing becomes very expensive, people become reluctant to move and spend longer hours commuting. The city as an efficient labor market thus works less well. It also means companies invest in real estate instead of more productive investments while banks favor firms that have large real estate portfolios instead of those with the best business models. High housing prices thus result in the misallocation of labor and capital and undermine the competitiveness of cities. Over the past three decades Asia has experienced an urbanization rate unprecedented in human history. While the rapid urbanization helped to fuel economic growth, it has overwhelmed many cities, especially with respect to housing. While the demand for housing rapidly increased, the supply reacted slowly, resulting in high housing prices.

In an attempt to gauge the magnitude of the problem, ADB's economic research team gathered housing price data for 211 cities in 27 developing countries in Asia. Combining the data with the income of households allowed us to calculate the price-to-income ratio, the most common measure for housing affordability. The average price-to-income ratio across all cities is at 15.8, which is classified as severely unaffordable. In developed countries the ratio stands at around 4. A further aggravating factor is that access to formal finance is still low in many Asian countries and housing finance expensive. How to solve the housing crisis? First, better data means better policies. Housing price data are rarely collected systematically in cities. Policy makers therefore struggle to assess the magnitude of the problem and are unable to assess the impact of existing housing policies. Several governments in the region, including Malaysia and the Philippines, have recognized the need for better data and introduced new programs to systematically collect more information on the housing market. Rich data sources are also becoming available through new information technology developments and can offer relatively inexpensive options to improve the understanding of the housing and labor market.

Second, easing supply constraints will lower housing prices. Housing prices are high because the rapid increase in demand has met a sluggish supply response. One of the main reasons is that cities have been slow in providing new developable land at low cost. Rigid land use regulations and coordination problems across administrative boundaries often delay the process. In the best case, the provision of new land is linked to the increase of affordable housing. For example, in Singapore the government provides land parcels at lower prices to private developers to build affordable housing for the middle class.

Third, provide affordable and efficient public transportation. Recent research in the United States found that better transportation can substantially lower housing prices. An efficient and affordable within-city transportation system allows people to move quickly within the city and expands the potential area for commuting to jobs. It thereby alleviates the need to live in urban centers and eases the housing demand. Upgrading public transportation systems in cities in Asia would therefore not only ease the massive congestion problem, but also help reduce housing prices.

Finally, promote the rental market. The focus of housing policies has often been on enhancing homeownership. While homeownership offers certain advantages, such as the accumulation of a physical asset, it also carries risks, such as overborrowing and lower labor mobility. The rental market remains small in most Asian cities, especially for low-income groups. Developing a thriving rental market that offers a healthy mix of both public and private rental housing should therefore be encouraged. The public rental housing stock needs to be expanded and better managed. The participation of the private sector can be encouraged by providing financial incentives, such as tax exemptions or subsidies, for building private rental housing.

As cities in Asia continue to grow, they urgently need to tackle the housing unaffordability crisis. Housing unaffordability could undo many of the benefits that urbanisation brings. As cities are the center of economic activity, unaffordable housing undermines the competitiveness of the economy and of sustainable development. ∎

[The article was first published as an ADB blog.]

PREETY BHANDARI
Director, Technical Advisor (Climate Change & Disaster Risk Management), ADB

GLOBAL CLIMATE ACTION IS NEEDED

After a disappointing 2019 UN Climate Change Conference, there is a need to restore confidence that the intergovernmental process can deliver on mitigation, adaptation, and finance

The 2019 United Nations Climate Change Conference, also known as COP25, that recently concluded in Madrid, was expected to put in place the final piece of the rulebook for the historic Paris Agreement, which was designed to address greenhouse-gas-emissions mitigation, adaptation, and finance. The meeting also was meant to set the stage for enhanced pledges by countries in 2020 to work toward keeping global temperature increase below 1.5 degrees Celsius.

Instead, the world witnessed a prolonging of the negotiation process, and an unwillingness to compromise for the greater good. The reluctance to commit to higher ambition and action is driven by economic and political considerations, as well as social upheavals. At COP25, the looming scenario of the US, the second largest emitter, walking away from the Paris Agreement, dissuaded other big emitters from tabling their proposals for enhanced climate actions. Further, the diverse interests of various parties for using market mechanisms to pursue climate priorities became all too evident. This complicated ongoing negotiations on Article 6 of the Paris Agreement, Consequently, proposals relating to transitioning to new carbon markets floundered with one group of countries rightfully insistent on ensuring environmental integrity. Associated with this was the direction of shares of proceeds from the cooperative approaches under the new markets that would ensure automatic funding for the Adaptation Fund. On the other hand, the vulnerable countries were seeking a mechanism to compensate them for the losses and damages.

The issue is the financing of action in developing countries and the target of $100 billion in financial flows from developed to developing countries by 2020 that was agreed at COP15. The OECD estimates that climate finance provided and mobilised by developed countries to developing countries in 2017 reached a little over $71 billion. But what developing countries want at this stage is an early assurance that, as agreed in Paris, a new financing commitment will be agreed to by 2025. So far, there have been no concrete signals that this will happen.

The upcoming presidency of COP26 by the United Kingdom will have to untie the proverbial Gordian Knot of the negotiations. Future commitments to financing, as expected, would hold the key to encouraging improved action. Facilitating a dialogue within the Group of 77 and China grouping on how to narrow the divergent interests in this bloc is needed. On one side will be the big emitters, and on the other the small island developing states, least developed countries, and other vulnerable countries. The Article 6 conundrum need to be resolved through an enhanced approach. A lot will ride on the UK's leadership in 2020 to coalesce and converge diverse interests on the intractable issues. ■

[The article was first published as an ADB blog.]

WATER POLICY FOR YOUTH

The Government of India is in the process of drafting a new water policy for the nation. This is a much timely initiative. However, looking at the implementation of previous water policies it would be interesting to see if this one would remain another piece of wish list or a real guiding document to manage India's dwindling water resources. The country is entering its most difficult yet defining decade in so far as water is concerned. Half of the country is now severely water stressed.

As we welcome the New Year 2020 and a new decade, we are reminded of the fact that many cities of the country face a "Day Zero" warning that means water availability – at least in so far as groundwater is concerned – is going to reach to a critically low or almost nil condition. In the last six to seven decades, we have already utilised about 70 to 80 per cent of the usable water meant for ourselves as well as for our future generations. By 2030, beginning of the next generation, we would have just half the water we would need.

As a child and a youth, I freely plunged into a river or a water body. Gradually, as I grew up, it became difficult to find a clean water body to take a dip. Many of these precious water resources have been vanishing so fast. I had never ever imagined, as a young boy, that I would ever have to buy water in bottles and that I would fear to take a dip in a river or water body for the level of pollution. In simple terms, that is the degradation we have experienced. People of my generation have certainly failed to arrest this decay. The crisis has been growing and we have reached a point in history where the youth have been agitating across the world to remind us of the criminal offence we have committed. We have already overused and abused the future generations' water entitlements. You can call it we are on overdraft with the water credits that belonged to the future generations. We, the people in our 40s, 50s and above, are currently using the water of our future generations. This is the water

The Government of India has planned to come up with a new water policy and it is expected to address significance of involvement of youth in water conservation. It is not hard to infer that the dire state of water bodies in India do require immediate and effective action, especially in areas which are drought struck. Not only the polluted surface water but the depleting ground water table is also a major concern. Sustainable use of resources is where we are lacking. If measures are not taken with immediate effect and policies are not followed, we might soon face a "Day Zero" leaving no water for future generations

injustice being done to our youths and future generations of humans. This has to change and with engagement of the youth themselves. That's why I call it to be the defining decade and it is going to be the most difficult decade in our lifetime.

The new National Water Policy must have a special chapter for the youth of the country. This is not just because the youth need to take leadership in managing our water resources since India is set to become the youngest country in 2020, but also because the youth is fast disconnecting from the natural resources. My own experience shows, as you move from villages to cities, the knowledge and perception of youth on water changes. The city youth is starting to believe water comes from taps and bottles, the village youth still considers monsoon as a source besides rivers, ponds and wells. There are aberrations but this general trend points to a dangerous crisis that we are going to face by the time we reach 2030 by when most of the current day youth would be leading their family economies, public discourse and national policy making.

The water policy therefore must have a two-point agenda in its youth section. First to make the youth of the nation understand the importance of natural resources in holding and recharging water systems and their related biodiversity; and second to help them develop as leaders to work on water resources use and management in sustainable manners by recognising the inter-relation between water systems with communities, livelihoods, biodiversity and all other aspects of the society. It should also give a lot of emphasis on the new and emerging challenges such as climate change. While it is important for the youth to study for degrees and to secure jobs, it is equally – even more –important to understand the importance of water conservation. This will help them reduce the water illiteracy leading to less abuse and pollution of water resources and more awareness and action towards conservation.

Water crisis is intensifying despite conservation efforts by both government and civil society organisations. This is because the damages we have done to our natural resources in the past are starting to unfold. Natural forests that we have destroyed; rivers that we have ravaged; and water bodies that we have

RANJAN K PANDA
Convenor, Combat Climate
Change Network, India

THE NEW NATIONAL WATER POLICY MUST HAVE A SPECIAL CHAPTER FOR THE THE COUNTRY'S YOUTH. WHILE IT IS IMPORTANT FOR THE YOUTH TO STUDY FOR DEGREES AND TO SECURE JOBS, IT IS EQUALLY – EVEN MORE –IMPORTANT TO UNDERSTAND THE IMPORTANCE OF WATER CONSERVATION. THIS WILL HELP THEM REDUCE THE WATER ILLITERACY LEADING TO LESS ABUSE AND POLLUTION OF WATER RESOURCES AND MORE AWARENESS AND ACTION TOWARDS CONSERVATION

encroached upon have brought us close to this "Day Zero" situation.

The vision for the future is rather an emergency agenda to ensure water security. Let the youth be prepared to understand the crisis and take the leadership in solving the same. The water policy should be the first step towards this. ∎

[The views expressed are the author's own. They do not purport to reflect the views of Urban Update.]

INTEGRATED APPROACH FOR CLIMATE ACTION

Extreme weather and deepening impacts of climate change are risking infrastructure, environment, human lives, and jeopardising our future visions

As per the National Institution for Transforming India (NITI Aayog), Chennai is amongst the 21 cities to exhaust its groundwater by 2020. For the last few years Chennai has been struggling to meet its water demands. These images of Puzhal Lake, the primary rain fed reservoir in Chennai, Tamil Nadu were acquired by the Operational Land Imager on Landsat 8.

According to the India Meteorological Department data released by Statistics Ministry, in parts of Tamil Nadu, Kerala, Rajasthan, Gujarat and North-east, average temperature over the last decade has risen by nearly one degree Celsius as compared to the historical average in the 1950-80 period.

In a study conducted by Climate Impact Lab with the Tata Centre for Development at UChicago, India is projected to see a 10 per cent increase in death rate due to climate change.

Such statistics which are available for most cities for different sectors of environment clearly reveal how we have failed to respond sufficiently to climate change by finding integrated solutions. Unregulated growth and excessive resource utilisation are the key contributors to heat related issues, pollution, pressure on environment, etc. cumulatively causing climate change. While there have been efforts to respond to climate change by individual actors it needs to be effectively incorporated in Urban Management through strategic partnerships and contextually responsive programmes. Planning in India today is unresponsive to its needs and desires. This is because the actors of urban management work in isolation which is visible in unprecedented challenges India's fast-urbanising centres are facing.

Urban Management deals with devising an integrated approach towards governance, organisation and planning. Urban management should encompass planning and implementation along with enforcement. Urban management aims to enhance the capacity of institutions to be sustainable, transparent and accountable in operations and decision making. The actors of urban management namely government, private and community sectors need to integrate. Quality of management is affected by the degree of cross sectoral coordination based on the awareness on regional, local, historical, political, economic and cultural differences. Urban Management must attempt to engage with the neglected past and provide guidelines for our cities to be able to plan for changing high aspirations of citizens.

This will be facilitated by focusing on the institutional framework and adopting a decentralised process which is well framed in The National Urban Spatial Planning and Development (NUSPD) Guidelines 2014 for planning India's cities, authored by Swati Ramanathan, Chairperson of Jana Urban Space Foundation, at the behest of the Ministry of Urban Development, and the Planning Commission, Government of India.

The NUSPD guidelines rest on two pillars, the integrated strategic framework and the physical framework. The strategic framework seeks to achieve a balanced approach between the three planning principles: Environment, Economy and Equity.

Since the three principles work in cohesion, their inter-dependencies should be capitalised on.

VISION AND PLANNING

While addressing the cities current demands and future prospects, the planning vision should articulate inclusive and environmentally sensitive growth. Planning should employ an integrated management approach to respond to the complexities of the urban landscape

♦ Economy: People are the drivers for formal and informal economic sectors. Capital generation should not be the mere focus of economic policy but it should also aim for quality of life and healthy environment. This focus on social and environmental infrastructure will inherently have sustainable economic returns. Hence strategic management by concentrating on livelihood needs and civic amenities is important.

♦ Equity: Inequitable growth is a major reason for concern in Indian cities. While urbanisation is synonymous with economic growth the benefits of this growth are reaped only by a small section of the population. India accounts for one-third of world's poor. In-spite of the extraordinarily large amount

SHREYA SHETTY
Advance Associate, Jana
Urban Space Foundation

SNEHA MARIA VARGHESE
Associate, Jana Urban
Space Foundation

Satellite image of Puzhal Lake showing the effects of Climate Change in a span of one year

of study on urban poor there is lack of satisfying the basic needs. The lack of access to civic amenities and economic opportunities deteriorates the living condition of the urban poor. The deviations of laws and regulations are observed partly due to this absence of services, leading to the unregulated expansion of the cities which adversely affects the environment.

♦ Environment: Urban consumption and waste directly affects the ecological balance. The consumption of resources needs to be replaced by sustainable alternatives methods such as 'smart technologies' in infrastructure, waste systems, transportation and other sectors. These adopted systems in each sector need to work in cohesion with each other. The recent studies on climate change show a spike in the mortality rate. If actions that address the core of the problem are not taken it will have an irreversible impact.

IMPLEMENTATION AND ENFORCEMENT

Institutional framework is an integral part of development. With transparency, accountability in decision making and enactment, a healthy ecosystem can be created.

♦ Implementation: The grass root approach gives more awareness of the on-ground situation and allows implementation to be more informed and effective. This awareness amongst the actors of urban management at different levels will help them to respond in a more productive manner. Furthermore when responsibility is distributed to relevant actors at different levels, long process of statutes is avoided and it streamlines the implementation process.

♦ Enforcement: In India, the violation of the codes and regulations is one of the crucial reasons for shortcomings and failure of governance, planning, and development. Urban agenda needs to be translated into action by the enforcement of laws. These laws should be contextually responsive to prevent any confusion and conflict on representation and administration authority

The in-equilibrium between equity, economy and environment leads to the ineffectuality of climate action initiatives. Understanding the symbiotic relationship between the three E's, is essential to frame strategy that addresses not the symptoms but the causes of the problem.

It will be detrimental to believe that only strategic policies and actors working in isolation with the belief that 'one-size-fits all' and a top down approach is the solution for urban challenges.

In Indian cities where diverse cultures and economic groups co-exist, a decentralised system is indispensable. Collective effort in implementation with an effective framework for enforcement needs to be highlighted in our system. ■

"JAMMU, SOON TO BE ONE OF THE BEST CITY IN NORTH INDIA"

Almost a year ago when Chander Mohan Gupta was elected as the Mayor of Jammu, he promised the residents of Jammu that he would transform the city into one of the most beautiful cities of India. Urban Update asked him about a host of issues including implementation of smart city projects, Swachh Bharat Mission and overall development of the challenges he faces while managing day-to-day urban affairs.

Situated in one of India's most politically delicate state, Jammu city has its fair share of developmental issues. In a conversation with Urban Update, Chander Mohan Gupta, Mayor, Jammu Municipal Corporation, talked about the unique set of challenges his city faces. He also highlights various projects the corporation has undertaken during his tenure to enhance the livability of the city

INCONSISTENT CITY GOVERNANCE

Jammu Mayor believes that the city has been unlucky in comparison to other Indian cities. Since the establishment of Jammu, the citizens have been able to elect their local government only four times. Ten municipal commissioners have been transferred within two and a half years, with three being transferred in the past year. This poses problems in municipal governance. People of Jammu are hardworking and even in difficult circumstances, they are putting forth their maximum efforts to ensure the betterment of Jammu.

Gupta is positive that making Jammu a Union Territory, after the abrogation of Article 370, would solve many governance issues. He says that several urban issues like mobility and education would now directly be overseen by the Jammu Municipal Corporation. "As we are handed over the responsibility of these aforementioned departments, we have observed that they are in a dire state and the remodelling of the traffic management and education systems is underway. Regarding traffic, our first move has been to begin the process of parking lots in the city at several identified spots. The entire project will cost around ₹32 crore and, I believe, it will help sort out the traffic mess to an extent.

'SWASTH JAMMU, SWACHH JAMMU'

The ranking of Jammu city in Swachh Sarvekshan has slipped from 260th rank in 2019 to 318th rank in the first two quarters of Swachh Survekshan 2020. The mayor says that he had intensified the efforts to improve the cleanliness in the city. He says, "our primary objective has been to ensure cleanliness and sanitation in the city. Our staff at each level has worked hard to ensure a cleaner environment for Jammu. We have put in efforts to improve the solid waste management capacity of the corporation over the years. Initially, we were only working with 20 autos for garbage collection, which has now grown to 120. We are moving towards 100 per cent door-to-door waste collection in the region and will continue to procure more of such vehicles in the near future. When I became mayor my slogan was "Green Jammu, Clean Jammu-Swasth Jammu, Swachh Jammu, Hasta Muskrata Jammu" (Healthy Jammu, Clean Jammu, Smiling Jammu) Having sufficiently worked on the city's sanitation, now we are moving ahead with the slogan "Badalta Jammu, Nikhartha Jammu" (Transforming Jammu, Blossoming Jammu). We have also signed an MoU worth ₹85 crore to establish a solid waste management project. The project would take a year or two for completion. Meanwhile, we are working on composting units owned and operated by the MC on its own. We have an aim to be enlisted in the top 10 in the near future.

PRESERVING JAMMU'S HERITAGE, NATURAL AESTHETICS

Jammu has a rich cultural heritage and the mayor is working to preserve heritage buildings. Gupta says, he had started a renovation project for the Mubarak Mandi, an integral heritage site of the city, with a budget of ₹66 crore. Special attention has been given to this project and experienced craftsmen and sculptors from various states have been employed in order to preserve authenticity.

"We are also aiming to build one of the best zoos of North India in Nagrota district. This particular zoo would be an excellent tourist destination and will be constructed in a budget of ₹62.5 crore and also we are trying to build a landscape on the similar lines of that of the Ahmedabad's riverfront. Various other tourist destinations and facilities are being constructed as we speak and

SHANIA JAMES
Editorial Assistant

I believe Jammu would become one of the biggest tourist destinations in North India in the near future."

Projects have been initiated to preserve and beautify our water bodies and lakes. The work of providing boat rides on two major lakes in Jammu is already underway and the facility will be opened for the public use soon. Each ward has been issued a fund of ₹25 lakhs for the same. The fund would also be utilised to maintain appropriate sewage management in each ward including fencing of the drains. We are planning to incorporate gyms in the open spaces of each ward of Jammu. Tenders have been released for the same and the open public gyms would soon be a part of the lives of the citizens here. As is the case for almost all Indian cities, the issue of free-roaming cattle is also common here. We have identified the lack of animal shelters in Jammu as the primary reason for this and a mega cattle pound is being constructed here. DPR is in development and you will see it in the near future.

Chander Mohan Gupta, Mayor of Jammu Municipal Corporation

THE PATH FORWARD

One of the major complaints from the citizens is the lack of adequate streetlights. For this, there was an ₹37.5 crore worth project which was formulated some time ago but was never acted upon. This year I followed up on the same. An MoU has been signed with Energy Efficiency Services Limited (EESL)and the work has already begun. Every day, we are installing around 400 to 500 streetlights and around 10,000 light poles have been installed in Jammu under this project. EESL would also be responsible for the upkeep of the installations for a time period of seven years. The upkeep process would be digitised as each pole has been assigned a unique digital number and in case any technical issue pops up on their servers, immediate corrective action would ensue.

To improve security, we have launched 'Jan Suraksha Yojana', an improvisation of the Center's "Pradhan Mantri Suraksha Yojna." Under this, we have set up separate offices to better the surveillance in each ward. We have also installed 500 high mast light and CCTV cameras which turned out to be an effective security measure to prevent petty crimes like chain snatching. We have also introduced a scheme under which each house can avail two CCTV cameras for an amount of ₹500. ∎

(The interview was transcribed by Akshit Pushkarna, Editorial Assistant, Urban Update)

FINANCING & LEGAL ASPECTS OF SUSTAINABLE URBAN TRANSPORT

Along with ensuring stable and robust financial flows and institutional strengthening, the key to achieve the goal of sustainable urban transport would lie largely in the extent of technical capacity building achieved at the local level

Sustainable Urban Transport (SUT) systems have become the need of the hour for developing economies worldwide. As per a study of the Asian Development Bank in 2013, road congestion was estimated to cost Asian economies 2–5 per cent of annual GDP due to time losses and increased transport costs (ADB, 2013). Transport and mobility in Indian megacities contributes to high energy consumption and toxic greenhouse gas emissions. It therefore demands not just local concern but national-level policies and programmes which can promote cities to adopt a sustainable approach in transport infrastructure planning.

CURRENT STATUS

Transit-oriented programmes in India follow a centralised-model approach with a focus on developing mass transit systems in large cities through established size requirements of the city to be eligible for funding. For instance, the JnNURM focused on only 65 main cities. However, the actual responsibility of development and execution of transit plans and infrastructure lies mostly with the state governments; except two states (Maharashtra and Gujarat) which have delegated it to the cities. These plans of the states are presented to the Ministry of Urban Development (MoUD) for selected projects which are eligible to secure funding support under national programmes such as JnNURM, now succeeded by AMRUT. The paradigm followed in these State plans, even today, lacks an integrated approach to transport planning.

At a policy level, India embarked on a significant move towards sustainability with the National Urban Transport Policy of 2006. The policy laid emphasis on incorporation of urban transport as a parameter within urban planning, promotion of clean energy and better technology, involvement of private sector and adoption of non-motorised and public transport. The growing impetus on public transport was reflected in funding availability for BRTs, procurement of rolling stocks (buses), etc. through JnNURM. Apart from programmes like JnNURM, Government of India extends financial support for urban transportation projects through various schemes. These include schemes offering 50 per cent equity share in metro projects and Viability Gap Funding Scheme. Under Viability Gap Funding (VGF), the Central Government offers funding up to 20 per cent with an increased limit of 30 per cent for rail-based MRTS projects and 40 per cent for PPP projects from the public budget.

The nuances of different financing models such as Complete Government Funding-Owning, Special Purpose Vehicle (SPV)/Corporate Model, PPP Model as well as Private Sector Model were explained by RK Singh, Director, IRSDC. He shared his views on several recent initiatives by the government such as Metro Rail Act, TOD Policy and Unified Metropolitan Transport Authority (UMTA) which will help streamlining the planning and execution efforts in the sector. He also threw light on some of the salient features of Metro Policy 2017 such as TOD and Value Capture Finance, commitment from state government for financial sustainability, measures to enhance non-fare box revenue, cost reduction by standardisation, indigenisation and inducing competition, issuance of bonds by Metro Rail Companies and promotion of PPP of all forms, apart from already mentioned options of Central Government assistance in the form of VGF and Equity Sharing model.

Certain cities are already working on sustainable transport. Whereas, smaller cities continue to lack financial capacity and resources to plan for SUT systems. However, these cities have the opportunity to avoid being trapped in a car-oriented development of transport infrastructure. New Delhi offers several lessons through the case example of Delhi Metro Rail Corporation (DMRC). As highlighted by KK Saberwal, DMRC has adopted carbon credits and other green initiatives to offset the huge financial cost involved in the Delhi Metro network infrastructure. It is the first metro system to earn carbon credits under the Clean Development Mechanism (CDM) by UNFCCC with projects such as Regenerative Braking, Modal Shift, MRTS PoA and Solar PV Project approved under it. Some of the key sustainability policies of DMRC include Sustainability in Motion Policy, Environment Policy, Water Policy, Waste Management Policy, Energy Management Policy and Solar Policy. Under the Solar Policy, DMRC has entered into a power purchase agreement with Rewa Ultra Solar Mega Power Plant (off-site) to get power for running metro thereby reducing rates by 20 per cent as compared to current rates payable to

ANUSHKRITI & ANAMIKA YADAV
TERI SAS Scholars

IN ORDER TO STREAMLINE THE INSTITUTIONAL FRAMEWORK, THERE IS A NEED TO SET UP AND OPERATIONALISE EFFECTIVE INSTITUTIONS SUCH AS UNIFIED METROPOLITAN TRANSPORT AUTHORITIES (UMTA)

the energy supply companies. Further, it has also undertaken placement of solar panels on roof tops of service buildings, depots, stations and parking lots, contributing to the overall savings in operating expenses and thereby enhancing financial sustainability of the metro system. To cater to first-last mile connectivity, DMRC has recently entered into an agreement with a service provider for making available battery-operated e-vehicles (called e-richshaws). Sustainability initiatives adopted by DMRC can also be noted in the Faridabad Green Metro Corridor which is powered by solar power of capacity of about 2 MW and energy efficiency projects registered under the Gold Standard, demonstrating continual improvements in energy consumption at Phase-II and Phase-III stations of DMRC.

CHALLENGES

The biggest challenge faced in the implementation of transport projects arises from the lack of coordination mechanisms due to institutional scattering, especially at the metropolitan level. These institutions lack technical capacity at the local level and suffer from slowdown effects of multiple levels of bureaucracy. Further, urban local bodies (ULBs) continue to suffer from lack of financial capacity and resources; thus making identification of new sources of revenue by city authorities absolutely crucial. There

is also need to redirect financial focus away from highway construction to public transport development. Linkages between funding and performance evaluation are missing at present.

In the current planning framework, there is lack of cooperation among different departments and practically no instrument to channelise funding from urban development to SUT systems. Even the Comprehensive Mobility Plans prepared by cities lack integration with the City Master Plans. Further, the urban transport planning paradigm across the country emphasises more on the physical aspects of transport networks and fails to address a user perspective. The limited capacity at the local level, in terms of both, knowledge and overall manpower, also stands as a major barrier to effective realisation of SUT systems. As highlighted by Prasanna Patwardhan on behalf of the Bus & Car Operators Confederation of India, during a recently organised conference on Sustainable Transport, some of the key legal challenges include the absence of an apex body for integrated transport services, different rules for different modes of transport, transport being a state subject hindering seamless national integration and unfavourable taxation regimes for public transport. He also emphasised on several financial challenges such as difficulty in securing equity capital, debt as the only available finance, and collateral

security requirements for securing project finance.

RECOMMENDATIONS

In order to streamline the institutional framework, there is a need to set up and operationalise effective institutions such as Unified Metropolitan Transport Authorities (UMTA). At the same time, cities must ensure the creation of a separate Urban Transport fund which can be financed through capturing value from beneficiaries of resources generated in project influence zone. Public institutions must develop innovative instruments for capturing both indirect and proximity benefit value and reducing dependency on real-estate development for financing of urban transportation projects. Some of the instruments to capture proximity benefit value include introduction of additional property tax (at a higher rate in the project influence zone), levy of one-time betterment charges to generate up-front resources for part-funding of capital cost and higher Floor Space Index (FSI) upon payment of up-front fee to the ULB. Indirect benefits value can be tapped through instruments such as congestion pricing, and carbon credits.

The choice of instrument would vary depending upon factors such as existing density, availability of complementary instruments, demand for commercial real estate, and administrative efficiency of ULBs. ■

PINSKY PRESENTS VIRTUAL REALITY OF DELHI'S AIR POLLUTION AT COP25

A london based artist, Michael Pinsky familiarises world leaders at the United Nations' Climate Change Conference - the 25th Conference of Parties (COP) held at Madrid from December 2 to 13. In an interview with Urban Update, he opens up on the significance on his initiative

One of the biggest problems Indian cities face is of air pollution. The issue has grown exponentially in the past fews years and no city has fared worse than Delhi, where, during the months of October and November, the AQI often deteriorates beyond measure, literally. In a bid to familiarise the world with the deadliness of the air that the citizens of Delhi breathe, Michael Pinsky, an artist based in London, exhibited pods that simulate Delhi's air in the recently held COP25 conference. The visitors experienced shortness of breath in the pods that simulate the condition of air that citizens of one of the most populated cities experience on a daily basis. The artist shared with reporters attending the event that he has tried to 'distil' Delhi's environment in these pods by using safe perfume blends and none of the actual harmful toxins. In an interview with Urban Update, Michael Pinsky spoke about what motivated him to put forth Delhi's problem to the world, among other things.

WHAT INSPIRED YOU TO CREATE THESE SIMULATION PODS?

I began working on this in Norway with some environmental psychologists on a project that would change people's perception of climate change. The problem we have in the West is that people are aware about climate change but it does not impede their everyday lives and hence, it is difficult to get them engaged with the conversation on this. I feel that since the causes of air pollution and climate change are very similar in nature, it would be easier to engage western people with climate change through the lens of air pollution. I was working with these ideas back in 2016 and some images from New Delhi during a marathon run in November caught my attention. These pictures were incredibly shocking; people running in the marathon through the haze and it was the first time, I believe, where air quality had crossed the measureable 999 anywhere in the

world. These particular images really captured my imagination and I thought how critical this issue has now grown to be. This prompted me to begin work on such an installation where people could actually experience the severity of such high level of air pollution as it is one thing to just see these images and speculate and giving your whole body an experience of what it's like.

WHEN DID YOU START WORKING ON THIS? HOW DID YOU COME UP WITH THE SIMULATION?

I started experimenting on this in Norway where I displayed it for the first time back in 2016. Initially, the method I used was to infuse water in cotton and ran the fumes of combusted diesel through the water and then through cottonvia an exhaust pipe. This distributed the smell of the combusted diesel into the pods. The problem using this method was that the vapors generated were hard to control. So when I exhibited the pods the next time in London, I worked with a London based company called International Flavors. It is the largest fragrant company of the world and they have a large database of chemicals that are safe andcould replicate the scent of air. They also have perfumers based in different cities and I worked with a perfumer based in Delhi. He helped me in recreating the air similar to Delhi. We did have to change the final air a lot

to ensure due diligence on health and safety standards. It is not quite what I wanted it to be but I believe we acquired a balance between the replication of the environment and meeting the health standards adequately as it could have exposed the visitors to high levels of lung cancer. This is the 11th time I have displayed this. We have shown it in other places like Norway, London, Geneva, Germany, Vancouver, Melbourne, Manchester, New York, and in Madrid.

WERE THERE ANY CONSIDERATIONS HIGHLIGHTING ACTUAL IMPACTS ON HUMAN HEALTH IF SUBJECTED TO SUCH TOXIC AIR FOR A LONG TIME LIKE PEOPLE OF DELHI ARE EVERY YEAR?

We worked with the World Health Organisation (WHO) and I also met a surgeon from New Delhi who related horrifying data of people under 30 who suffer from lung cancer even though they never smoked in their life. These were absolutely astounding and motivated me further to highlight the situation.

To be specific about my artwork, I am a sculptor and no health expert. Basically, what I am interested in is presenting an artifact that could give a fairly accurate visual portrayal of the picture to get the attention of people. This piece is never exhibited outside of any event where health experts from around the world are speaking for their

AKSHIT PUSHKARNA
Editorial Assistant

consideration and certainly WHO have people who can communicate the exact health damages associated with inhaling such poisonous air in person as you go around the podfor those who are interested. In fact, we do a lot of human interaction around this piece and you can always get better informed from more credible sources. The basic idea behind this is to captivate the attention of people.

This WHO campaign is called 'Breathe life' and in this campaign raises awareness about the health risks of short-lived climate pollutants, which contribute significantly to global warming and air pollution. The campaign advocates action in the areas of knowledge sharing between cities, increasing monitoring, supporting solutions and educating people.

WHAT HAS BEEN THE RESPONSE LIKE TO THE DEMONSTRATIONS TILL NOW?

It has created a lot of attention, thrown a spotlight on the issue. A lot of health and environment ministers, heads of states, high level politicians of various countries have had experience in the pods. I think, especially from a western perspective, people are extremely shocked when they went in the New Delhi pod because I think people don't understand how bad the condition gets for weeks and the severity of the situation is difficult for the western people to comprehend. Particularly in India, they think air pollution is the by-product of industrial growth. That mindset needs to change. The same was the case for China but they have aggressively tackled the issue, bringing down air pollution levels in their capital city of Beijing significantly. Regulation is difficult in India, I believe. ■

More than 1 Cr houses sanctioned under PMAY(U)

NEW DELHI: Hardeep S Puri, Minister of State (I/C) for Housing & Urban Affairs (MoHUA) has informed that out of a validated demand of 1.12 cr houses in urban areas, 1 cr houses have already been sanctioned. Further, a total of 57 lakh houses are in various stages of construction of which, nearly 30 lakh houses have been completed. Compared to the earlier JnNURM scheme, PMAY (U) has achieved 10 times more in a span of 4.5 years.

Durga Shanker Mishra, Secretary, MoHUA has informed that the Mission has covered a range of social groups which comprises around 5.8 lakh senior citizens, 2 lakh construction workers, 1.5 lakh domestic workers, 1.5 lakh artisans, 0.63 lakh differently-abled (Divyang), 770 transgender and 500 leprosy patients as of now. Empowerment of women is an inbuilt design of the scheme where the ownership of the house is in the name of female head of household or in the joint name. The implementation of PMAY (U), has induced a remarkable investment in housing sector especially in the affordable housing segment. The houses sanctioned so far under the Mission involve an investment of about ₹5.70 lakh cr with Central Assistance of

₹1.6 lakh cr. The Central Government is contributing ₹1.00 lakh to ₹2.67 lakh for each house under different verticals of the scheme. As on date, nearly ₹60,000 cr of Central Assistance has already been released. Presently, works of about ₹3 lakh cr are ongoing and by the time Mission accomplishes its target of 1.12 cr houses, the entire activity will trigger an investment of more than ₹7 lakh cr. The scheme promotes a synergetic partnership of the people and the Governments. In consonance of the Mission Guidelines, States/UTs are also contributing a substantial amount of ₹1-2 lakh on an average which can go upto ₹6 lakh per house. Beneficiaries are also contributing their share in the range of ₹2 lakh to ₹5 lakh per house.

In order to supplement the additional requirement of providing the Central Assistance, over and above the budgetary support, Government has made a provision for raising Extra Budgetary Resources (EBR) to the tune of ₹60,000 cr of which, ₹38,000 cr have already been raised and disbursed. Government has also created an Affordable Housing Fund (AHF) in the National Housing Bank (NHB) with an initial corpus of ₹10,000 cr using priority sector lending shortfall of banks/financial institutions

for micro financing of the HFCs

Government has developed a web based real time monitoring system called "CLSS Awas Portal (CLAP)" to ensure people's participation and transparency leading to efficient delivery and minimising grievances.

In addition to this, the construction activity under the scheme has had a huge impact on the other sectors of the economy with a multiplier effect in employment generation. Approximately around 1.20 cr employment has been generated through forward and backward linkages with about 250 auxiliary industries like, steel, brick kilns, cement, paint, hardware and sanitaryware. Due to investment being made in the scheme, around 568 lakh metric tonne of cement would be required for sanctioned houses; out of which 178 lakh metric tonne has already been consumed through completed houses. Around 130 lakh tonne of steel is required for the sanctioned houses; around 40 Lakh metric tonne of steel has already been consumed in the completed houses. It also has an impact on livelihood, transport sector, skill development, horticulture, landscape development sector, etc.

Government has identified many alternative and innovative technologies through a Global Housing Technology Challenge- India. This will usher a paradigm shift in the construction technology in India and will propel a host of economic activities. 6 Light House Projects are being executed in six states across the country which will act as live laboratories demonstrating innovative, proven construction technologies for speedier and cost-effective construction of houses which are sustainable, green, eco-friendly and disaster resilient.

The Ministry has launched Angikaar-a campaign that addresses and enables beneficiaries to adapt to life transformation that comes with shifting to a newly constructed house. Currently more than 12 lakh households have been covered through this campaign which will conclude on January 26, 2020.

- ♦ 1.20 Cr Jobs Created so far Under PMAY-Urban

- ♦ Cement Consumption Estimated at 178 Lakh MT While Steel Consumption Estimated at 40 Lakh MT

NITI Aayog releases SDG India Index

NEW DELHI: NITI Aayog released the second edition of the Sustainable Development Goals (SDGs) India Index, on December 30, 2019, which comprehensively documents the progress made by Indian States and Union Territories towards achieving the 2030 SDG targets.

The index—which has been developed in collaboration with the Ministry of Statistics and Programme Implementation (MoSPI), United Nations in India, and Global Green Growth Institute—was launched by NITI Aayog Vice-Chairman Dr Rajiv Kumar. Amitabh Kant, CEO, NITI Aayog; Renata Dessallien, UN Resident Coordinator; Pravin Srivastava, MoSPI Secretary and Chief Statistician of India; and Sanyukta Samaddar, NITI Aayog SDG Adviser were also present.

"In 2020, the world enters the final decade for achieving the SDGs— the 'Decade for Action'. And the Intergovernmental Panel on Climate Change (IPCC) tells us that we have 12 years left to save the planet from the worst effects of climate change. So, the time to act is now. The SDG India Index 2.0 enables India to both track and encourage accelerated progress to meet the SDGs across all its States and UTs," said Renata Dessallien.

India's composite score has improved from 57 in 2018 to 60 in 2019, thereby showing noticeable progress. The maximum gains have been made in Goals 6 (clean water and sanitation), 9 (industry, innovation, and infrastructure) and 7 (affordable and clean energy). All three states that were in the 'Aspirant' category (with score/s in the range of 0–49)—Uttar Pradesh, Bihar, and Assam—have graduated to the 'Performer' category (50–64). Five states—Andhra Pradesh, Telangana, Karnataka, Goa, and Sikkim—moved up from the 'Performer' category to the 'Front Runner' category (65–99). Kerala achieved the first rank in the composite SDG Index with a score of 70, followed by Himachal Pradesh at 69. Andhra Pradesh, Telangana, and Tamil Nadu ranked at the third position with a score of 67. The biggest improvers since 2018 are UP, Orissa and Sikkim.

The SDG India Index 2019 tracks progress of all States and UTs on 100 indicators drawn from the MoSPI's National Indicator Framework (NIF).

The SDG India Index 2019 is more robust than the first edition on account of wider coverage of goals, targets, and indicators with greater alignment with the NIF. The Index spans 16 out of 17 SDGs with a qualitative assessment on Goal 17. This marks an improvement over the 2018 Index.

Additionally, this year, the SDG India Index report has a new section on profiles of all 37 States and UTs, which will be very useful to analyse their performance on all goals in a lucid manner.

A composite score was computed in the range of 0–100 for each State/UT based on its aggregate performance across 16 SDGs, indicating the average performance of every State/UT towards achieving 16 SDGs and their respective targets. If a State/UT achieves a score of 100, it signifies it has achieved the 2030 national targets. The higher the score of a State/UT, the closer it is towards achieving the targets.

Classification criteria based on SDG India Index score is as follows:

♦ Aspirant: 0–49
♦ Performer: 50–64
♦ Front Runner: 65–99
♦ Achiever: 100

NITI Aayog has the twin mandate to oversee the implementation of SDGs in the country and promote competitive and cooperative federalism among States and UTs. The SDG India Index acts as a bridge between these mandates, aligning the SDGs with the Prime Minister's clarion call of Sabka Saath, Sabka Vikas, Sabka Vishwas, which embodies the five Ps of the global SDG movement: people, planet, prosperity, partnership, and peace.

The SDG India Index 2019 is available on an online dashboard, which has cross-sectoral relevance across policy, civil society, business, and academia. The Index is designed to function as a tool for focused policy dialogue, formulation and implementation, and moving towards development action pegged to globally recognisable metrics. The Index also supplements NITI Aayog's continuous efforts to encourage evidence-based policymaking by supporting States/UTs to benchmark their progress, identifying priority areas and sharing best practices.

The SDG India Index 2019 will also help highlight crucial gaps related to monitoring SDGs and the need for improving statistical systems at the National/State/UT levels. Further, the Index highlights the need for improvements in data collection, reporting, and methodology. NITI Aayog is also exploring partnerships for disaggregating data and developing capacity for real-time monitoring and measuring incremental progress.

Delhi gets its first **SMOG TOWER**

AKSHIT PUSHKARNA
Editorial Assistant

NEW DELHI: Delhi's first smog tower became operational on January 3 at the Central market, Lajpat Nagar. The tower was inaugurated by Gautam Gambhir, Member of Parliament, East Delhi.

The tower sucks in the polluted air and pumps out clean, filtered air. The operators rejoiced as once the tower became operational, the PM 2.5 reading, which was fluctuating around 165, around the smog tower area declined sharply to a mere two or three within a few minutes. The 20-foot tower has multiple blowers which emit up to 2,40,000-6,00,000 m^3 of clean air per day. The tower is developed by Dharmendra Bhaskar, Co-Founder and Managing Director of Shuddh Electronics Pvt Ltd, a Noida based startup, supported by Startup India initiative and is funded by Gautam Gambhir Foundation. In a conversation with Urban Update, Dharmendra Bhaskar said, "The machine operates on the principle of Advanced Controlled Electrostatic Precipitate, which is an advanced version of the filtration technology used in atomic reactors."

Bhaskar told Urban Update that he was working primarily on the tower for over a year now in close coordination with the consultation of a French engineer. "Air purifiers designed using this technology are already prevalent across Europe. You can find them even in bullet trains, where compartments are fitted with them," he said. The machine can adequately supply clean air to a radius of 300m, but Bhaskar expects the clean air to reach even further. The installation is made on a land which is directly built above a sewer drain and the air purifier also removes the stench from the air along with cleaning all sorts of impurities.

Experts have questioned the effectiveness of smog towers in India as previously installed air purifiers at ITO Chowk, which were modelled after the smog tower installed in Beijing, seized in 16 days. "Those air purifiers used HEPA technology, which is inadequate to tackle Delhi's air. They can be used for indoor air purification. This technology that we employ could provide a long term solution for Delhi's woes," said Bhaskar. The machine requires minimum maintenance as it is made up of washable and reusable components. The engineer estimates that a minimum of ₹3000 per month is required for its upkeep. The machine would operate 24 hours daily, but the exhaust speed would be reduced at night. The electricity requirement is about 40-55 units per day and Lajpat Nagar Traders Association would be billed with the electricity cost.

When asked about further plans, Bhaskar said, "This is the pilot project for us and is supported by Gautam Gambhir. We are open to make more of such installations in the near future." The project operation is set for a minimum of 10 years and based on its effectiveness in the area, it could probably be expanded to other parts of the city as well.

SDMC's 'Eco Hub on Wheels' to discourage single-use plastic

To discourage use of single-use plastics, South Delhi Municipal Corporation (SDMC) has launched "Eco Hub on Wheels" in Najafgarh district on December 23. It is aimed to reduce, reuse and recycle plastic waste at one spot altogether and plastic waste would be exchanged with cloth, jute bags, manure, discounted coupons and T-shirts or sweaters. The vehicle was launched by Kamaljeet Sehrawat, Leader of House, Delhi Assembly, Rajdutt Gehlot, Deputy Mayor, SDMC and Sanjay Sahai, Deputy Commissioner, Najafgarh. In exchange of 5kg of dry waste the citizens of the area can now avail 20 per cent discount on food coupons, T-shirts etc.

Dharamshala Smart City to improve city transit

Shrikant Baldi, Chief Secretary, Dharamsala Smart City Limited (DSCL), has directed a meeting of the Board of Directors for the smart city project to work on bettering the basic facilities of the city, primarily the transit network. The meeting approved to work on left-out streets of the city which span a total road length of 16.10km, walkways (2.420km) and stairs (1.42km) in a budget of ₹28.63 crore. Decisions to construct a smart parking at Dalai Lama Temple road in a budget of ₹5.75 crore and development of a sample 'smart road' of 2.75km from ISBT to Education Board was taken during the meet.

'India will achieve its 100 GW solar energy target by 2022'

MADRID: Prakash Javadekar, Union Minister of Environment, Forest and Climate Change (MoEF& CC) on December 10 said that India is going to add 67 GW of solar energy capacity in the next three years and is going to achieve 100 GW solar energy target by 2022.

While attending UN Climate Change Conference (COP25) the minister said that the country is witnessing a sharp fall in its prices due to the enhanced production. He added that the prices of solar energy used to be ₹20 per unit and now it is just 10 per cent of it. The Union Minister said that five years ago India had just 3 GW of solar energy. "Today we have 33 GW of solar energy and it's huge." Urging the world to do away with fossil fuels, Javadekar said, "We have today 37 per cent energy capacity through renewables. We want to increase it because our energy demand is rising so we have decided to have 40 per cent of energy capacity through renewal energy

which is a mix of solar, wind and bio-waste." As per the minister, the country requires $500-700 billion in renewable energy and supporting grid investment over the coming decade in order to meet its renewable energy targets. India is set to reach 144 GW of renewable energy by the end of 2021-22 financial year. India has a clear ambition to transition to a cheaper lower emission electricity system, and that ambition is attracting healthy global investment, added Javadekar.

'AI course for TN schools from 2020'

CHENNAI: In order to make students well versed with new technology, the Government of Tamil Nadu is planning to introduce a course on Artificial Intelligence (AI) for students of Classes VI to IX. The course will be taught in all government schools across the state and will be introduced in a phased manner starting from the coming academic year. According to a senior official, a number of students have shown interest in artificial intelligence through projects and seminars. He said that once the course is introduced in schools, students will be able to get in-depth knowledge on the subject and explore a new world of opportunities in technology. A UNESCO study on 'Artificial Intelligence in Education' pointed out that AI enables students to access equitable and inclusive education for all while helping advance collaborative learning.

The Department of Education, Tamil Nadu is in talks with tech giants like Microsoft and Google to help in formulation of a comprehensive course on AI. The course will be formed based on the class in which the students are studying. The department is considering making the AI an elective subject. Students of Class VI will be introduced to basics of information and communication technology and AI. The course will build up as the students go to higher classes. The department will also ensure that all students have complete access to all resources related to the course and will also get an opportunity to work with the experts. It is also planning to recruit new teachers, who will also be trained by experts from partnering tech-giants, for the course.

The state had also announced last year that it will build well-equipped, high-tech and smart classrooms in 6,000 government schools across the state at a cost of Rs 462.62 crore.

Gurugram authorities make environment plans

Municipal Corporation of Gurugram (MCG), the Gurugram Metropolitan Development Authority (GMDA) and Haryana State Pollution Control Board (HSPCB) were working together to develop a district level plan catering to the environment of Gurugram. According to officials, the plan lays out steps that will manage the district's solid waste, water and sewage, air pollution, etc. and would be submitted to the Central Pollution Control Board (CPCB) by December 31. As per the plan for air quality and noise pollution developed by the HSPCB, GMDA is tasked with preparation of water and sewage management plan, while MCG would prepare solid waste management plans.

Green corridors for 'SMART' ambulances

All ambulances in Gujarat will soon be fitted with digital sensors in order to make 'green corridors' for ambulances rushing patients to the hospitals. This has been done keeping in mind the fact that ambulances getting stuck in traffic jams are a rather common sight and lead to a number of deaths. Gujarat has decided to fit all ambulances with GPS systems, infrared sensors and wireless sensors. Sound sensors at traffic junctions will also detect the frequency of the sirens blown by ambulances. The sensors are being tested for smooth functioning at different vehicle speeds.

'21.6% divyang children lack access to education'

BENGALURU: United Nations Educational, Scientific and Cultural Organisation's (UNESCO) State of Education Report for India-2019 – Children with Disabilities was released in Bengaluru on December 11, 2019. According to the report, 3.30 lakh children between the age of 5 and 19 suffer from one or the other form of disability. Out of these, 21.6 per cent children have never received education while 15.5 per cent previously went to school but later dropped out.

"The illiteracy rate among children with disabilities remains at 60 per cent, which is an alarming 16 per cent higher than the state average of all illiterate children (as per the 2011 Census)," said Eric Falt, Director, UNESCO,New Delhi. Suresh Kumar, Minister of Primary and Secondary Education, while speaking at the launch said that the state's policy for education of children with special needs will be fully implemented and efforts will be made to reach out to those who were left out.

The N for Nose report also enlists 10 recommendations to the Government of India to be implemented for making education more inclusive for special children. Citing data from the Ministry of Human Resources Development, the report said, "In Karnataka, data from 52 schools had discrepancies regarding differently abled-friendly toilets, 58 schools regarding functional differently abled-friendly toilets, 83 schools regarding need for ramps, 68 regarding ramp availability, 88 regarding handrail availability."

The report also pointed out that the schools in the state face a shortage of funds from the Centre. The number of School Readiness ProgrammeCentres (SRPCs), which were started in 2012-13 in Karnataka, also dropped along with the number of human resources for these centres. The SRPCs started training children with intellectual impairment for successful inclusion in mainstream schools, especially in areas where home-based education was high. The report also stated that Gujarat, Karnataka, Kerala and Maharashtra have gender gaps at both secondary and higher secondary levels.

Centre agrees for building 22 green highways

BANGALORE: While speaking at the inaugural session of the 10th edition of Excon-2019, Nitin Gadkari, Minister of Road Transport and Highways, announced that his Ministry had given the nod for 22 green highways in Karnataka. The projects will cost ₹1.5 lakh Cr cumulatively. A new alignment of the Pune-Bengaluru Express Highway is also included in the list of highways that are being developed, which will be completed in the next few years at a cost of ₹50,000 crore. Excon-2019 is a five-day international construction equipment and construction technology trade fair and is organised by the Confederation of Indian Industry in association with the Government of Karnataka, Ministry for Road Transport and Highways and the National Highway Authority of India (NHAI).

"We are making 22 green express highways. Today we cleared the Pune-Bengaluru project as a Green Express Highway, a new alignment of 600 km, costing about ₹50,000 crore." Gadkari said, adding his ministry and the state have sanctioned 2,300 km of new roads where the detailed project report is ready. He further added that Yediyurappa has given the assurance to clear that any hassles related to land acquisition and environment clearance will be cleared on priority basis. During his speech, Gadkari also announced that the Centre has agreed to bear 80 per cent of the land acquisition cost of the ring road project in Bengaluru.

Delhi to get dedicated Cycling-Pedestrian corridor

NEW DELHI: The National Capital will soon get a dedicated green corridor for cyclists and pedestrians – 'Delhi Cycle Walk'. Amit Shah, Union Minister, Ministry of Home Affairs laid the foundation of the project on January 6, at Tughlakabad. Hardeep Singh Puri, Minister of State (IC) Ministry of Housing and Urban Affairs (MoHUA), Anil Baijal, Lieutenant Governor of Delhi, Tarun Kapoor, Vice Chairman, Delhi Development Authority (DDA) were also present at the occasion.

The Delhi Cycle Walk will loop around Delhi and connect with metro stations, bus stands, residential areas, commercial areas recreational districts and educational districts. The Cycle Walk will also connect lakes as well, focusing on rejuvenating dried lakes. The Cycle Walk aims to promote use of non-motorised transport and making travel more economically affordable; reducing vehicular emissions in the city; connecting forests and lakes in the city through a common pathway.

The salient features of the 'Delhi Cycle Walk' as proposed are – solar powered lights, CCTV cameras to be installed at every 100m stretch and will be further connected to a centralised monitoring station. Further, there will be facilities like toilets, water points. It will also provide parking facility for cars and two-wheelers. There will be rain water harvesting chambers as well. "The green corridor will benefit a lot of people while travelling to and fro offices, colleges hence improving first and last mile connectivity in the city", said Amit Shah, at the ceremony. On the occasion, Hardeep Puri said, "The project will not only be beneficial for the people of Delhi but will also be beneficial for the city."

Although, the complete project involves development of stretches covering over 200 km, but in the first phase a stretch of 36 km will be developed. The authority has chosen three lines in the first phase – Nilgai Line from Badarpur to Malviya Nagar Metro Station (20.5 km); Peacock Line from Malviya Nagar Metro Station to Vasant Kunj Malls (8.5 km) and Bulbul Line from Chirag Dilli to Nehru Place and Iskon Temple (7 km).

Food for plastic waste at 'Garbage Cafe'

NEW DELHI: In a first for Delhi, the City Centre Mall of Dwarka Sector-12, has come up with 'Garbage Café', which exchanges single-use plastic waste for food. The 'Garbage Café' is a combined initiative of South Delhi Municipal Corporation (SDMC) and the mall authorities.

Nilesh Modi, Mall manager, told Urban Update, "It is a significant initiative of SDMC. Although, sanitation and cleaning is one of the major responsibilities of the civic body but this initiative to clear up plastic waste which was very much required is a commendable step. Similar models have been already existing in a few foreign countries but this is the first for the Indian Capital. Suresh Anand, Director, City Centre Mall, Dwarka supported the cause and partnered with the SDMC to open the Garbage Café."

Regarding the administering of the meals, Kuldeep Rathi, Administration In-Charge, City Centre Mall told Urban update, "We already have a decided proportion on how much food will be given in return of how much plastic. As per our menu, in exchange of 1kg plastic waste we serve a complete meal. In return of 250g of plastic one can get snacks like Samosas and Pakoras."

Regarding the operation of the café, Modi said, "It is simple. Any person who wants to eat has to bring us plastic waste, keep it in the bin and provide them with a food coupon which is color coded according to the amount of waste submitted." As per the mall authorities, the café opens at 11:00 am and closes at 11:00 pm.

On fate of plastic collected, Rathi said, "We are working with the SDMC's official vendors and we handover all the waste collected to them for recycling of the same." Further, Rathi said the change in people's attitude especially the sweepers and rickshaw pullers near the mall. He said, "Earlier when the sweepers used to collect plastic waste and dump at the nearest dumpsite. But now, with this initiative in place, these people and a lot of rickshaw pullers, rag pickers collect these plastic bottles while doing their routine jobs and then come to us with the waste to have food. This initiative is basically making people not to litter but to collect their plastic waste and have food in a proper food court in a mall, added Rathi. The behavioral change witnessed among people will help keep the streets clean and will also help the corporation recycle more plastic so that this plastic waste menace can be reduced significantly, improving the area's solid waste management.

GHMC to add 60 more 'She-marts'

The Greater Hyderabad Municipal Corporation (GHMC) planned to add 60 more 'She-marts' (female public toilets) in the city, despite spending ₹5 crore per zone on poorly maintained public toilets. The corporation had planned to install 60 new toilets in public parks and open spaces. The civic body will introduce new toilets under corporate social responsibility costing ₹12 lakh each. A GHMC official said that ₹5 crore is spent per zone for maintenance and renovation of the toilets annually. For proper maintenance of public toilets in the city, the corporation has decided to rope in major companies in the city and they will be penalised for substandard and poor maintenance.

Amritsar MC to fine for open dumping, littering

Amritsar Municipal Corporation can now impose penalties ranging from ₹250 to ₹25000 for littering, open defecation and open garbage dumping as new rules have been implemented with the Municipal SWM Project. A new committee has been set up to decide the penalties for various offences. Open defecation will attract a penalty of ₹250 along with spitting and littering in public areas. Hotels, restaurants, commercial establishments, slaughterhouses and meat sellers will have to pay ₹1000 for open dumping of waste. Amount of ₹25,000 would be fined for dumping industrial and commercial waste.

Students in Odisha develop 'smart water dispenser'

BERHAMPUR: Three students from Kendriya Vidyalaya, Berhampur, developed a 'smart water dispenser' to ensure equal distribution of drinking water through pipelines in any urban or rural habitat to combat the future water crisis. This 'smart water dispenser' has been developed by P BiswanathPatra of Class XI, Sawambhu Mandal and Sritish Kumar Gouda of Class X with support of their physics teacher Santosh Kumar Padhi. 'Smart water dispenser' is an electronic water flow controlling mechanism that can replace the water meter and provide control of the cost amount of water supply to the authorities for equal distribution. The cost of the prototype is just ₹2,000. Its main components include an easily available microprocessor, a solenoid valve and a flow sensor.

As per Padhi, Commissioner of Berhampur Municipal Corporation (BeMC) and the local executive engineer of the Public Health Engineering Department (PHED) have already shown interest in the practical use of the project and requested the 15 units for its trial.

According to Patra, these units can be connected to water supply pipes to each house in an area that will be directly connected to a central server of the local governing body by GSM or Wi-Fi. The central server can decide and control the supply of an equal amount of water to every home as per need.

After participating in 'Atal Tinkering Marathon 2018-19', this innovative project is shortlisted as the top 50 innovations under the 'Atal Innovation Mission' of NITI Aayog.

COP25 ends with no deals on pressing climate change issues

MADRID: The longest climate discussions have concluded without any conclusion. The primary goal of the conference was to ensure the full operation of the Paris Climate Change Accord before the deadline of 2020, curbing global warming, greenhouse gas emissions and elevating the pressure faced by third world countries dealing

with the effects of climate change, yet the two-week long United Nations Framework Convention on Climate Change 2019 ended with fruitless negotiations in Madrid. Delegations of several countries rejected the draft agreements prepared on the final day of the conference, leaving no other alternative than to remove all phrases and provisions from the agreement, leaving behind only the generalities and no specific decisions. Antonio Guterres, UN Secretary General, expressed his dissatisfaction from the outcome and said that the international community has lost an important opportunity to show "Increased ambition on mitigation, adaptation and finance to tackle the climate crisis". One of the biggest let downs was the lack of a decisive action on the carbon markets. The initial plan was that carbon dioxide, the main greenhouse gas, would be curbed by putting a price on its emissions. This allowed countries or companies to trade emission permits. These prices were to gradually be reduced as the world moves to a low emission future.

The UN meeting also agreed upon the "Chile-Madrid Time for Action" declaration. The declaration calls for an improvement to the current pledges to reduce emissions, in line with the Paris Agreement's target to control global warming.

RMC boost efforts for accomodating homeless

Rourkela Municipal Corporation (RMC) has intensified efforts to bring homeless people to its three night Shelters for Urban Homeless (SUH) due to severely cold temperatures. Yeddula Vijay, Commissioner, RMC said that the corporation will ensure that no homeless spends a night in the open. He added that two teams have been positioned at the railway station and the new bus stand and another team will pay visits to vulnerable places to rescue homeless people. On an average, around 10 homeless persons are being rescued daily, said an official.

DTC installs CCTVs, GPS, panic buttons

Delhi is ready to install CCTV cameras, GPS and panic buttons in Delhi Transport Corporation (DTC) and cluster buses plying on the city roads. The project is undertaken by the state owned Telecom Consultants India Limited (TCIL), who are aiming to complete the installation project worth Rs 128 crore in a year's time for the entire fleet of buses. Arvind Kejriwal, Chief Minister, Delhi, flagged off 100 standard floor buseson December 27 with these features. For now, the newly commissioned buses are equipped with 10 panic buttons and three CCTVs.The panic button would alert law enforcement agencies in the vicinity of any unfavorable incident and immediate action would ensue.

IIT-B, Washington University researchers to monitor air pollution effects in Mumbai

MUMBAI: As a part of the collaboration between Washington University in USA researchers will bring in advanced air quality and health monitoring equipment to Mumbai and study effects of air pollution along with the researchers from Indian Institute of Technology, Bombay. A new research facility for this, the Aerosol Air Quality Research Laboratory, was inaugurated in the IIT-B campus at the Environment Science and Engineering (ESE) department.

Using devices like portable electrocardiogram monitors, real-time air quality monitoring through wearable mobile sensors, and detailed spatial data using satellite maps, the researchers will study real-time health impact due to air pollution.

Pratim Biswas, the Lucy and Stanley Lopata Professor in the McKelvey School of Engineering, said "Research of this kind is critically-important for India as there are complex problems and solutions that can't be developed individually." He further said, "Capacity

building is needed, and for this we will bring high-tech instrumentation for fundamental research in aerosol science and engineering. There are over 2 lakh such instruments in China but India currently has a few 100."

Under the National Clean Air Program, IIT-B has already collected samples of particulate matter pollutants (PM2.5 and PM10) for 10 of the 18 non-attainment cities (including Mumbai) for identifying sources, as mandated by MPCB. The samples, which were collected from five locations in each city using four samplers (two each for PM10 and PM2.5), have been kept in the new lab.

The final report will be submitted to MPCB by December 2020.

Tamil Nadu tops in Good Governance Index

CHENNAI: In the Good Governance Index released by Union Ministry of Personnel, Public Grievances & Pensions on December 25, Tamil Nadu has bagged the top spot among 18 big states in the country. Although, the state performed well in five parameters among six, including public health, public infrastructure, judicial and public security among others, it lagged behind in commerce and industries parameter.

The GGI takes 10 sectors into consideration including: citizen-centric governance; public health, infrastructure & utilities; social welfare & development; agriculture; allied commerce & industries; human resource development; judicial & public security; economic governance; and environment. Performance in these sectors is measured on the basis of 50 indicators. Tamil Nadu followed by Maharashtra, Karnataka and Chhattisgarh secured the top four positions, followed by Andhra Pradesh (fifth), Gujarat (sixth), Haryana (seventh) and Kerala securing eighth rank. Madhya Pradesh is at the ninth rank, West Bengal at the tenth position, Telangana (11th), Rajasthan (12th), Punjab (13th), Orissa (14th), Bihar (15th), Goa (16th), Uttar Pradesh (17th) and Jharkhand at 18th position. To rank different states under the index, different states and Union Territories were divided into three different groups - Big States, North-East & Hill States and UTs. All states and UTs were ranked on all indicators separately and composite rankings were given to these UTs and states in their groups. Among the group of big states, Tamil Nadu topped the ladder in Public Infrastructure and Judicial & Public Security parameters. The state was able to secure a spot among top 10 when it comes to parameters like environment (3rd), human economic governance (5th), resource development (5th), social welfare and development (7th) and agriculture and allied (9th), and it was ranked 14th in commerce and industries.

SIDCGL to supply treated water for farming, construction activities

PANAJI: The Sewerage and Infrastructural Development Corporation of Goa Limited (SIDCGL) has decided to supply treated water for use in four sectors – agriculture, farm forestry, toilet flushing and industrial and commercial projects. This has been done keeping in mind that 30 million liters of treated water flows down the drains of Goa daily, simply because no one is ready to use it.

According to the action plan prepared by SIDCGL, owing to the limited supply of freshwater, use of treated water is imperative and the need of the hour. PadmakarSheldarkar, Managing Director, SIDCGL said that treated water can be used for all kinds of non-potable needs. He added that if the residents show interest, STPs can be developed further to treat water so as to make it usable for drinking purposes. The action plan elaborated that treated water can be used for irrigation in certain places for agriculture, for watering urban forests, trees public gardens, trees, shrubs and grassy areas, for toilet-flushing and for cooling purposes in industrial and commercial sectors. Treated water can also be used for cleaning and other purposes at railway stations and trains, for recharging ground water and for construction purposes as well.

The action plan says that using such water can provide significant economic, social and environmental benefits which are key motivators for implementing such reuse programmes.

The benefits of using waste water include, but are not limited to, increased water availability, revenue generation for the state, reduced over abstraction of surface and groundwater, reduced energy consumption associated with production, treatment and distribution of water, water importation or desalination.

Goa schools to teach civic sense as subject

PANAJI: In order to better the condition of civic amenities in the state, the Goa Education Development Corporation (GEDC), decided to integrate subjects like sanitation including personal sanitation, waste management, and traffic sense in the school curriculum. The subjects are being taught in schools in Goa as a part of a pilot project launched in 2018 to educate children about basic civic sense.

The GEDC is planning to include officials from various civic bodies in order to provide the children with an 'educational feed' by officials who work in the field. This will help the children to better understand the day-to-day work carried out by civic officials and how, as residents, the children can help in keeping the state clean.

The pilot project was launched in 2018 by Manohar Parrikar, Chief Minister, Goa after he discussed the importance of these subjects with educationists in the state. By educating the children, the condition of civic amenities in the state is bound to improve.

Kanta Patnekar, Chairman, GEDC said that the Corporation undertook 80 per cent of the research behind the project, as the inception mandate is to develop competitive, flexible and value-based education system to meet the individual, institution and socio cultural development needs of the people of Goa. GEDC is now in the process of finalising the content for the academic year 2020-2021. Patnekar said that the authority is integrating the subjects in the school curriculum and the new subjects will be added as optional papers. As per the plan, traffic sense will be a part of Physical Education subject and the rest of the two subjects will be part of the science and social science subjects.

Punjab gov makes its website 'Divyang' friendly

To make public information more easily accessible for handicapped people, Social Security, Women and Child Development Ministry, Punjab made its website 'Divyang' friendly. 'Divyang' people will be able to access information on various schemes and press releases more easily. Almost 40 websites of various departments of Punjab government are now 'Divyang' friendly. The rest would soon be made the same under the 'Accessible India Campaign'. Officials have said in a press release that the website has been updated to ensure that the design, content and pictures uploaded are accessible to people who are visually challenged. Features include screen reader and magnifying tools for better viewing experience.

Srinagar Smart City to upgrade firefighting infra

As the cases of fire incidents spiked up in recent times, Srinagar Smart City authorities are preparing to gear up their fire resilience by upgrading all of the fire stations. The authorities will be strengthening and integrating all 23 fire stations of the city and install over 100 fire hydrants at various locations. A total of 15 small fire tenders to enhance ability to access congested locations would be procured along with large fire tenders with 7500 liter capacities. Along with the procurement of six firefighting boats for vigil in Dal Lake, two fire stations would also be developed in the region. Shahid Choudhary, Deputy Commissioner and CEO of Srinagar Smart City, after visiting several fire stations, on January 2, said that the plan was determined "in tandem with the unique requirements of the city".

Rajasthan Transport Dept observes 'No Vehicle Day'

Employees of the Transport Department of Rajasthan will now be observing a 'No Vehicle Day' on the first working day of every month. The decision was taken by Pratap Singh, Minister for Transport, Government of Rajasthan with the aim of promoting road safety and reducing sound and air pollution caused by vehicles. Singh said that all employees working in the Transport Department will come to the office as pedestrians, via bicycle or via public transport services on the first working day every month. This, however, will not be applicable to the ticket-checking squad or the differently-abled employees. It started the initiative from the first working day of 2020.

MCC to manage door-to-door waste collection

The Municipal Corporation of Chandigarh has decided to take over door-to-door waste collection under their administrative control over the waste collectors. The MCC has planned to provide collection vehicles to the sanitary workers and give employ them without changing their present working zones. Now the residents do not have to pay any fees to the garbage collector directly; instead pay the fee either through their water bills or property taxes directly to the MCC. KK Yadav, Commissioner, MCC said, "MCC will require at least 300 vehicles for the job at a cost of ₹21 crore".

Beijing manages to reduce over 17% pollution in 2019

BEIJING: The capital city of China, after running anti-pollution campaigns for five years has been able to cut smog levels in its metropolitan area by more than 17 per cent in 2019, data from Beijing's environmental authority showed on January 3, 2020. Municipal Ecology and Environment Bureau of Beijing said, the average concentration of PM2.5 were at 42 micrograms per cubic meter (MCM).This marked a 53 per cent lower concentration of PM2.5 in 2019 as compared to its concentration of 89.5 MCM in 2013. The average concentration of PM10 particles in 2019 was 68 MCM while that of nitrogen dioxide was 37 MCM, both of which were in line with national targets.

Pollution levels slipped down 17.65 per cent from an average 51 micrograms per cubic metre in 2018, but still above China's official air quality standards of 35 micrograms per cubic metre and more than four times higher than the annual PM2.5 concentration guidelines of 10 micrograms per cubic metre by the World Health Organisation (WHO).The Environment Bureau of Beijing said that the city has an average PM 2.5 concentrations of 33.3 per cent higher in autumn season, which is higher than other seasons and winters are still relatively severe.

Since 2014, Beijing has been on the frontline of the war with growing pollution in China and the city has worked towards relocating many polluting industries. The authorities have even shut down some factories, reduced the consumption of coal in and around the city and improved fuel and emission standards. Although, some pollution levels still exceed international recommendations, Beijing's rapid progress has been hailed by United Nations as an example of how quickly things can be turned around.

MCC launches nation's first 'Ploggathon'

MYSURU: The Mysuru City Corporation (MCC) adopted a different approach to tackling the problem of plastic waste in the city as a part of its Swachh Survekshan 2020 drive. JavagalSrinath, former cricketer and Krishne Gowda, a comedian flagged off the 'MysuruMahaPloggathon' in the presence of PushpalathaJagannath, Mayor, MCC and GuruduttHegde, Commissioner, MCC among others.

The 'Ploggathon' invited residents of the city to participate in a race. The resident who collected the highest quantity of plastic waste was adjudged the winner. The Corporation had set up three different routes for the participants to choose, starting from KoteAnjaneyaswamy temple. One group headed towards JC Circle and Gun House while the second headed towards KR Circle and the D DevarajUrs Road. The third raced to Silver Jubilee Clock Tower and Ashoka Road and all of them converged at Town Hall at the end. The concept originated in Sweden where people picked up plastic waste while jogging. It soon became a trend across the world and a major part of the global environment movement. For the race, each participant was given a cloth bag by the MCC to collect trash. At the end of the race, MCC weighed the plastic collected by each of the participants. Mayur, a resident of Agrahara, was declared the winner as collected 2.3 kg of garbage. According to DG Nagaraj, Health Officer, MCC, a total of two tonnes of plastic waste was collected from the defined routes as a result of the 'Ploggathon'. The race was one of the first events in the city to witness citizen participation to such an extent with hundreds of residents participating in the event.

MoRTH releases Year End Review 2019

NEW DELHI: The Ministry of Road Transport and Highways (MoRTH) recently released the 'Year End Review 2019'. The Review enlists the work carried out by the Ministry in the past year in comparison to its work in earlier years. In the year 2018-19, the ministry completed about 10,855 km length of roads and 5,494 km long road projects were newly awarded to the respective bodies executing them. The rate of development of roads improved from just about 11.7 km per day in 2013-14 to about 30 km per day in the year 2018-19. As a result of all these improvements, the length of National Highways in India increased from 91,287 km in April 2014 to about 1,32,500 km as on December 31, 2019. The annual budget of MoRTH also increased from Rs 33,745 crore in 2013-14 to Rs 1,37,354 crore in 2018-19. During the current year, an expenditure of Rs 85,275 crore has already been incurred till November 2019 including the internal and extra budgetary resources of National Highways Authority of India (NHAI).

According to the Report, MoTRTH plans to expand the network of National Highways by about 60,000 km in the next five years. The Ministry also intends to improve connectivity of 100 tourist destinations and construct bypasses for 45 towns and cities during this period. With the aim of increasing the funding for National Highways, NHAI intends to raise Rs 1 lakh crore through Toll-Operate-Transfer (TOT) model of asset monetisation in the next five years. Finances are also likely to accrue from Securitisation of Toll Revenues as well as the setting up of Infra Investment Trust (InvIT).

All these achievements, according to the MoRTH, will help in reducing the connectivity problem in the remote areas of the country, significantly decongest the metropolises and help in reducing air and sound pollution in major cities across the country.

Goa continues to suffer from poor waste, sewage disposal

PANAJI: Only a few days after declaring itself open-defecation free (ODF), the state of Goa is facing issues with waste and sewage disposal. According to the order of the National Green Tribunal (NGT), the sewage disposal system in the state does not cover all households. Most of the houses are not connected with the sewerage network, which has resulted in pollution of 11 river stretches. This is because sewage from these houses flows directly into adjacent rivers.

Presently, the state has a total of 399 sewage treatment plants which are not capable of covering all households in the state. The Government of Goa has therefore decided to build eight new STPs in the state with the aim of giving universal access to sewage disposal systems. According to the government, these new STPs will be connected to drains and other sources of sewage. The Goa State Pollution Control Board (GSPCB) has put a condition stipulating that units which generate more than 100 kg of waste a day must make their own arrangements for disposal and treatment of waste.

The Goa Waste Management Corporation (GWMC) has also been engaged in segregating waste. Despite this, its waste treatment facility in Saligao continues to receive mixed waste. This is where the local self-government authorities fail to function fully since they are responsible for door-to-door waste collection and strict implementation of waste segregation norms. Apart from this, due to the absence of scientific waste disposal facilities, a number of panchayats continue to burn waste openly causing air pollution.

Chandigarh to get 70 EV charging stations

With the aim of encouraging and expanding the use of electric vehicles in India, the central government approved the installation of a total of 70 charging stations in Chandigarh. The sanction has been given as a part of Phase II of the Faster Adoption of Manufacturing of Electric Vehicles in India (FAME India) scheme. Under the scheme, a total of 2,636 new charging stations will be set up in 62 cities in 24 states and UTs. Once the installation of these charging stations is complete in Chandigarh, at least one charging station will be available in every sector. This will help in boosting the confidence of EV users regarding range anxiety.

Capital's green cover increases by 19 sqkm

India State of Forest Report (ISFR) has announced that the forest cover in Delhi has increased by over 19 square kilometers between the years 2017 and 2019, boosting the total green cover of the city to 21.88 per cent of Delhi's geographical area. Since 2017, the dense forest cover in the city has increased by 3.03 square kilometers and tree coverage has increased by 16 sqkm. The total forest cover of Delhi now stands at 195.44 sqkm. The report further highlighted that 6.72 sqkm area was covered by very dense forest (VDF), 132.30 sqkm under open forest and 56.42 sqkm under moderately dense forest (MDF).

From **ECONOMY** to **ECOLOGY**
A lot to restore in 2020

ASHOK WANKHADE
Managing Editor

The year 2019 has been quite a rollercoaster ride for the economy and ecology. Not only the economy nosedived in the previous year, the environmental health also slumped as the quality of the green cover saw a decline and pollution levels spiked. It is not hard to deduce, looking at the current scenario, that in the year 2020 there is a lot for the government to restore and improve

The Indian economy saw a significant slowdown in 2019 which affected many sectors including infrastructure, construction and housing in urban areas. Housing for All, the affordable housing scheme launched by the Government of India is also facing challenges because of low consumer demand owing to weak economic growth in the country. The slump in the economy has affected employment generation and incomes. In fact, many industries saw massive job cuts. Due to this the consumer demand for the housing sector is drying up. As per estimates, there are around 12.76 lakh housing units in 30 major cities in India which are lying unsold. In November 2019, Nirmala Sitharaman, Union Finance Minister announced a stimulus fund of ₹25,000 crore for the ailing housing sector, with independent pension funds LIC and SBI agreeing to invest another ₹15,000 crore in the sector.

Not only the Affordable Housing sector suffered the economic crisis, but the construction sector also faced difficulties. The awarding of new road construction contracts and other infra projects was stalled due to reduced capital expenditure from the government bodies. This posed as a major reason for bringing the sector to a struggling phase. As per the Controller General of Accounts, in the first 11 months of the previous fiscal year, the government's expenditure saw a decline of eight per cent and to meet the deficit target of FY2019 the funding for the infra projects were cut down.

ECOLOGY REPORT CARD

The New Year was welcomed with the good news about the nationwide green cover. Prakash Javadekar, Union Minister for Environment Forest and Climate Change (MoEF & CC), launched the India State of Forest Report 2019 stating an overall increase in the green cover. As per the report, the Very Dense Forest (VDF) cover, which are the real carbon sinks, increased by a mere 1.14 per cent in between the years 2017 and 2019. The Medium Dense Forest (MDF) saw a marginal increase of 0.04 per cent from 2017 to 2019. Whereas, the Open Forests (OF) increased by 5.7 per cent in the past decade.

Although, the figures mentioned in the report seem good enough, the ground reality differs a bit. As per the environmentalists, the number of trees has risen but the quality of forests has seen a decline in the past decade. Also, the classification of forests and its definition is a matter of debate between the environmentalists and the authorities. The operation of authorities during the construction activities tends to raise a common question - whether it is beneficial cutting aged trees and replanting saplings as their replacement? The oxygen output of the forests depends on the age, specie and the natural vegetation of the area. Aged trees sequester more carbon as compared to young trees. The rising urbanisation also results in rising construction activities which directly harms the environment through deforestation, open dumping of debris, and so on. The previous year saw quite a few citizen movements on the subject like 'Save Aarey', 'Save Aravallis', and more. Planting of saplings to replace the number of trees razed for the project sounds convincing but is not at all a replacement for the loss.

Moreover, the India State of Forest Report presents a disappointing picture of the forests in North-Eastern India. The forest cover in six out of the seven sisters, excluding Assam, has has seen a significant decline of 18 per cent from 2011 to 2019. Manipur saw a decline of 499 sqkm of forest covered area, Arunachal Pradesh 276 sqkm, Mizoram 180 sqkm, Meghalaya 27 sqkm and Nagaland 3 sqkm.

IN CONCLUSION

Looking at the country's urban areas struggling with economic slowdown and the qualitative degradation of the ecology, it is not hard to infer that it is high time for the authorities to act fast to restore a lot in the new decade. ∎

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