



**Ahmedabad
University**

COVID-19, CLIMATE CHANGE AND CITIES: LEARNINGS FROM THE PANDEMIC

A Stakeholder Workshop Report

This report stems from a stakeholder workshop aimed at fostering dialogue among city officials, public health experts, and climate experts, about their experience of managing COVID-19 and the pandemic's influence on urban policy, innovation, and financing towards resilient and low-carbon development. The report features several Best-Practice case studies that emerged from the workshop.

Ahmedabad University, 2021

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AGENDA

Inaugural Session: COVID-19 and Climate Change

Inaugural Session	
Keynote Address	Pankaj Chandra Vice Chancellor, Ahmedabad University
The Third Assessment Report on Climate Change and Cities (ARC3.3)	Cynthia Rosenzweig Columbia University, NY William Solecki City University of New York (CUNY), US Minal Pathak Global Centre for Environment and Energy, Ahmedabad University
COVID-19 and Climate Change Linkages, Its Impact on Cities	Panagiotis Karamanos International Urban and Regional Cooperation (IURC)
State's Experience with COVID-19 and Recovery- Government of Gujarat Initiatives	Shwetal Shah Climate Change Department, Government of Gujarat
COVID-19, Cities and Climate Change – Key Findings	Darshini Mahadevia School of Arts and Sciences, Ahmedabad University
Panel Discussion followed by Q&A Session	All participants

Session Moderator: Dr. Minal Pathak

Technical Session I: COVID-19, Climate Change and Transport

Technical Session I: Covid-19, Climate Change & Urban Transport	
COVID-19, Climate Change and Urban Transport	Yakubu Bununu Ahmadu Bello University, Nigeria
City Experiences followed by Panel Discussion	Mangesh Dighe Pune Municipal Corporation Rajesh Pandya Surat Municipal Corporation Sajad Ahmad Tantrey Srinagar Municipal Corporation
Panel Discussion followed by Q&A Session	All participants

Session Moderator: Prof. Bhargav Adhvaryu

Technical Session II: COVID-19, Health and Equity

Technical Session II: COVID-19, Health and Equity	
COVID-19, Sanitation and Water – Learnings from Cities of Rajasthan	Himani Tiwari Directorate of Local Bodies, Government of Rajasthan
City Experience on COVID - Gwalior	Shishir Pankaj Gwalior Municipal Corporation
Climate Resilience Activities in Surat City	Kamlesh Yagnik Resilience Strata
Health and Equity in The City: Concurrent Challenges of Climate Change and COVID-19	Kevin Lanza The University of Texas, US
Panel Discussion followed by Q&A Session	All participants

Session Moderator: Dr. Darshini Mahadevia

Technical Session III: COVID-19, Urban Housing and Spatial Planning

Session III: COVID-19, Urban Housing and Spatial Planning	
Urban Housing & Built Form, COVID-19, and Climate Change	Joan Fitzgerald School of Public Policy and Urban Affairs Northeastern University, Boston, US
City Experiences followed by Panel Discussion	Hem Chettri Gangtok Municipal Corporation Ashish Verma International Urban and Regional Cooperation (IURC)
COVID-19 and Climate Change, Impact on Italian Cities	Marino Cavallo Metropolitan City of Bologna, Italy

Session Moderator: Dr. Minal Pathak



WORKSHOP INTRODUCTION

UCCRN South Asia Hub at Ahmedabad University hosted a workshop for facilitating discussions on the impact of the COVID-19 pandemic on climate change efforts in cities. The hybrid Workshop on 'COVID-19, Climate Change, and Cities' was organized on October 27, 2021, in Ahmedabad University. The workshop strived to foster conversation between city officials, public health experts, and climate experts on their experience with COVID-19 and how this could influence urban policy, innovation, and financing towards resilient and low-carbon development.

This event was a collaboration between four organizations:

1. The Global Centre for Environment and Energy (GCEE), Ahmedabad University,
2. International Urban and Regional Cooperation (IURC),
3. The Urban Climate Change Research Network (UCCRN), led by the Earth Institute at the Columbia University,
4. The Intergovernmental Panel on Climate Change (IPCC), where the technical support unit is housed in Ahmedabad.

Speakers included authors from the UCCRN ARC 3.3 COVID Element, urban policymakers, officials from Government of Gujarat's Climate Change Department and officials from municipal corporations across India.

The speakers represented the following cities- Boston, Texas, Bologna, Gangtok, Surat, Pune, Srinagar, Gwalior and Jaipur. Case studies prepared by various city and government officials, academicians and planners were discussed to highlight key strategies and success

rates of the various initiatives deployed during the pandemic. A total of 66 invited participants were involved in the workshop.

SUMMARY

- Cities are facing multiple simultaneous challenges like climate crisis, poverty and inequity, bio-diversity loss, haphazard developments, overburdened infrastructure systems, environmental degradation, urban resilience, and emergency preparedness, etc. The COVID-19 pandemic has confirmed the need of accelerating more resilient, healthier, and sustainable urban transformation pathways
- Historically, epidemics have led to infrastructure improvement concerning public health, like sanitation systems, building regulations enabling better ventilation in buildings, etc. Emerging challenges on human health are an opportunity to rethink the future of cities as sustainable, low carbon and resilient hubs for human flourishing and prosperity.
- Although COVID-19 and Climate Change are both global phenomenon, mitigations must be rooted in the local context in the urban areas.
- Many COVID-19 containment measures conflict with Climate Change strategies.
- COVID-19 pandemic is urban in nature, with 95% of all cases located in the urban areas. The urban character of Covid-19 was initially linked to high densities and crowded living conditions of the cities. However, the spread of the virus to rural India, and evidence from previous epidemics like Black Plague's spread to rural and market towns in England, reinforce the relevance of connectivity and mobility in disease transmission.

- As seen in cities like New York and London, factors far more relevant in the infection spread than density include land-use & connectivity, urban form, function and granularity, socioeconomic factors, urban services and environment, healthcare systems and urban policies
- Since density alone isn't responsible for the spread of the COVID-19 virus, well-managed high-density developments still remain an active option for climate mitigation in cities
- Global disruption of the supply chain and the lockdowns imposed by governments during the pandemic, generated positive short-term environmental impacts, including reduction in CO₂, PM_{2.5} and PM₁₀ emissions.
- In India, urban local governments that are already resource constrained faced financial challenges in managing the pandemic (food distribution, adequate healthcare infrastructure, and creating quarantine facilities in dense neighborhoods, etc.)
- While the pandemic led to positive trends like increased use of non-motorized transport and widespread adoption of remote work culture, that helped in emission reduction, it also led to limited use of public transport
- COVID-19 prevention & control accelerated many urban planning measures that generate co-benefits with climate action like air pollution reduction, reduced travel demand and promotion of active transport, regeneration of urban ecology, promoting bike sharing as major transport mode, promoting green and open spaces, reclaiming streets for people
- Sustaining the positive impacts from the pandemic will be challenging for cities.
- Health (co)benefits necessary for pandemic prevention and control include prioritizing healthcare expenditures, improved urban environment, refocused public health as means to city planning
- Slowed economic growth, exacerbated poverty and unemployment may shift the attention to economic recovery instead of climate action in resource constrained regions like India
- Incorporating nature-based solutions and innovative planning measures can improve resilience to both COVID-19 and Climate Change, offering co-benefits for health and well-being for all.
- Cities must include green recovery packages and build equitable access to health.
- Convergence of public health, affordable housing, and Climate Change research is vital for better risk anticipation and planning resilience frameworks that respond to multiple challenges like extreme weather events, natural disasters, epidemics, etc.
- Access to local level data is crucial to control the spread and severity of Covid-19; rigorous and regular mapping can enhance the local database and support integrated planning exercises.
- Creation of command and control centers to monitor COVID-19 spread, through contact tracing during pandemic, managing quarantine measures after travel, and for vaccination can become centers for rescue, relief and rehabilitation in times of disasters induced by the climate change.
- Carbon footprint of digital services and its impacts require further investigation.
- Inclusive planning and design that actively involve vulnerable groups are crucial to achieve a sustainable recovery.



INAUGURAL SESSION: COVID-19 AND CLIMATE CHANGE

SESSION SUMMARY

The Keynote address was given by the Vice Chancellor of Ahmedabad University, Dr. Pankaj Chandra. He emphasized the growing importance of cities for future research and academic programs at Ahmedabad University and stressed the importance of interdisciplinarity in addressing emerging issues in cities at the intersection of climate change and development.

Dr Minal Pathak, Senior Scientist, IPCC WGIII Technical Support Unit and Head of UCCRN's South Asia Hub introduced the activities of GCEE and the inception and future plans of UCCRN South Asia Hub.

Dr. William Solecki, professor at CUNY, introduced UCCRN, which began as a horizontal network on climate change research in 2007. The organization aims to bring together emerging group of researchers to provide opportunities for collaboration, knowledge exchange and share best practices. Developing integrated assessments around the core understanding of climate change and cities is a key goal at UCCRN. The First and Second Assessment Reports published in 2011 and 2017, are thoroughly researched documents that serve as a multi-faceted resource for practitioners and other stakeholders. The Third Assessment Report is expected to be published by the Cambridge University Press by late 2022. It is divided into eight monograph statements called "elements"- Architecture, Urban Design & Planning, Urban Climate Science, Financing Climate Action, COVID-19, Equity, Informality & Development, Governance & Just Transitions,

Nature-based Solutions and Integrated Infrastructure Systems. Through extensive stakeholder engagement workshops and continuous feedback on all proposed measures, UCCRN strives to develop reports that are significant not only in terms of scholarship but also in forwarding decision-making. Broad, global assessments are connected to ground realities of different regions across the world, to ensure a holistic understanding of the subject area.

Dr. Panagiotis Karamanos, from the IURC, focused on city-to-city cooperation between Indian and European cities, on specific pilot projects related to sustainable urbanization, including climate issues. He talked about the positive impacts of COVID on urban climate: reduction in greenhouse gas emissions, increased use of non-motorized transport, increased utilization of digital options and potential investment opportunities in emission reduction measures. Dr. Karamanos concluded with questions, "Can COVID-19 catalyze climate action? Do we have sufficient enforcement mechanisms to sustain the behavioral changes brought by the pandemic? What are the barriers we need to overcome for improved urban resilience?"

Mr. Shwetal Shah, a technical advisor at the Climate Change Department, Government of Gujarat discussed a study on impacts of air quality and urban heat island effect on vulnerable communities in five cities- Ahmedabad, Vadodara, Surat, Rajkot and Bhavnagar. The study highlighted significant improvement in the air quality index due to the pandemic and the lockdowns. No change in Urban Heat Island Effect was observed. However, the positive environmental impacts in all cities were short-lived and the air quality deteriorated after the lockdown was lifted.

Identifying vulnerable communities for effective government intervention remains a salient feature of the study.

Dr. Darshini Mahadevia, Coordinating Lead Author on ARC 3.3's COVID-19 Element, and Associate Dean of School of Arts & Sciences at Ahmedabad University, presented the key findings from the Second Order Draft of ARC 3.3.

The presentation categorized the interactions between COVID-19 and Climate Action in two broad categories: co-benefits and conflicts. Co-benefits like emission reduction, regeneration of urban ecology, reclaiming streets for people, reduction in motorized transport demand and increased dependency on non-motorized transport, tactical urbanism and promotion of green and open spaces were discussed with examples across the globe. Conflicts like inadequate water and sanitation facilities, overcrowded housing settlements, reduction in public transport ridership, constrains in financing climate action due to the economic deceleration, other extreme weather events were among were discussed with a special focus on vulnerable communities. In concluding remarks, Dr. Mahadevia urged the participants to explore a shift in narratives: from 'density accelerated the pandemic' to 'overcrowding and lack of sanitation & healthcare services accelerated and intensified the pandemic'.

Recommendations

- Develop frameworks to sustain the positive impacts and inclusive recovery strategies
- Regular and robust tracking and mapping of socio-economic indicators throughout the pandemic
- Explore the interlinkages between climate change, COVID-19 and communities with a humane perspective



Shashi Pandey

Himani Tewari

Ashish Verma

TECHNICAL SESSION I: COVID-19, CLIMATE CHANGE AND TRANSPORT

SESSION SUMMARY

In this session, the speakers highlighted the relationship between COVID-19, climate change and urban transportation.

Dr. Yakubu Bununu, professor from Ahmadu Bello University in Nigeria, presented a bird's eye perspective on the theme. In the wake of unprecedented urbanization predominantly occurring in the global south, he emphasized the need to build resilient cities with well-developed sanitation systems, transportation systems, housing, healthcare systems, disaster preparedness and climate action. He discussed how the pandemic resulted in reduced climate action finance and how designing well-oriented fiscal and economic recovery packages can accelerate the current low-carbon investments. The impacts of discontinuation of public transit and shift to private vehicles on revenue, stating that investing in public transport systems has never been more challenging. He also discussed co-benefits like reducing long trips, increased active mobility, transformation in urban space and increase in work from home/teleworking. While increase in cycling (during the pandemic) has been observed to exacerbate crowding in already limited urban cycling lanes.

Mr. Mangesh Dighe, environmental officer at Pune Municipal Corporation (PMC), introduced the key features of Pune's urban and transport planning interventions. Although ranked highly in India's Ease of Living index, Pune's urban sprawl is resulting in increased emissions. To combat this, the PMC increased electric bus fleet, created an integrated multi-modal public transport system, promoted non-motorized

transport, incentivized CNG use among rickshaws, endorsed tree surveys and plantation, waste processing plants and rainwater harvesting schemes.

Mr. Rajesh Pandya from Surat Municipal Corporation highlighted the significant role of municipal corporations in responding to and controlling the spread of the virus during the pandemic. He discussed several innovative non-pharmaceutical interventions urban local bodies undertook. Some salient examples include converting Sitalink buses into mobile sample collection units, oxygen stations called "Oxygen Express" and temporary ambulances. SMC also used its city buses as designated vehicles for escorting people from healthcare facilities and other vital services. Mr. Pandya also stated the lockdown played a significant role in emission reduction from the retail and pharmacy sector, recreation, transit stations and workplace. However, an increase in emissions in the residential sector was observed. He also emphasized that last mile freight distribution is an essential service in emergencies, especially for the provision of groceries and household goods, and should be prioritized moving forward. Public transport in Surat faces a major financial challenge with rise in capital costs and decline in revenues.

Mr. Sajad Ahmad Tantrey from Srinagar Municipal Corporation shared the corporation's experience of tackling the pandemic. He discussed interventions like mandated shutdown of educational institutions (schools, colleges, universities) and busy marketplaces, initiating sanitization drives in congested areas. Mr. Tantrey also highlighted that for a resource constrained municipal corporation like Srinagar, large-scale and timely sanitizing was a constant concern. Sanitizing densely built and populated areas were much harder to sanitize, hence the

municipal corporation reappropriate human resources (para-military personnel) and equipment (spring guns, water hoses, etc.) for sanitizing these areas. Local bodies also undertook relief work including distributing food packets, PPE kits, etc. The municipal corporation also established a 24x7 control room for monitoring cases, contact tracing and relief work. They would send a team of officials in adversely affected areas, to create micro-containment zones by putting up barricades and thorough sanitizing. Mr. Tantrey acknowledged the contribution of NGOs, philanthropists, health teams, and the community during this phase.

Recommendations

- Further investigation of digital services' carbon footprint.
- Innovative planning measures to promote non-motorized transport.





TECHNICAL SESSION II: COVID-19, HEALTH AND EQUITY

SESSION SUMMARY

This session had speakers speaking on a variety of topics- such as sanitation, climate resilience, city experiences and health.

Ms. Himani Tiwari, Directorate of Local Bodies, Government of Rajasthan, During COVID-19, like Mr. Tantrey, discussed actions taken by the state for prevention and relief during the pandemic. She discussed the Food for All drive and financial relief measures like PM CARES for Widows and Children. She discussed the role of inclusive decision making (with the communities), sanitization drives (especially in low-income areas), aggressive testing, contact tracing (and mapping) and strict implementation of lockdown in curtailing the spread of COVID-19. She also discussed the state's efforts in improving sanitation and cleanliness under the Swachh Bharat Abhiyaan (Clean India Mission); stated that 3 cities of Rajasthan were among the top 50 clean cities in the nation. Further elaborating, she stated Jaipur received 28th place for its efforts, followed by Jodhpur in 29th place.

Mr. Shishir Shrivastav, from Gwalior city Municipal Corporation also discussed the learnings from the corporation's response to the pandemic. GMC worked with the aim to provide timely doorstep support to the community and established the Integrated Control and Command Centre (ICCC), creating communication networks between doctors and patients. Real-time information on case counts, hospital bed-availability and other resources were provided along with online consultations with physicians, mental health professionals and

other healthcare staff. This was supplemented with regular mapping of the affected areas, number of patients, containment zones, etc. GMC also undertook aggressive, large-scale testing and collected 91,000 samples within the first few weeks of the initiative. Along with this, 50 medical staffers and 100 tele-callers appointed by GMC gave check-up calls to all patients twice a day. Medicine and other essentials were delivered to households with COVID-19 patients and each house in the surrounding was thoroughly sanitized by spraying disinfectants via sewer suction and jetting machines. Publishing helpline numbers and contact information of doctors', healthcare centers' and emergency services helped people take action. Appointing representatives for each of the 25 zones served as an effective strategy in managing the pandemic.

Mr. Kamlesh Yagnik, from Resilience Strata in Surat, introduced the city, its linkages to a strong economic base and history of frequent floods and plagues. He emphasized on a need to increase resilience in urban infrastructure to combat vulnerabilities and shocks caused by industrial accidents, extreme weather events, traffic congestion, high migration, and public health crisis. He also stressed on how the pandemic had adverse economic and social effects on the urban poor and migrant populations.

Dr. Kevin Lanza, professor at University of Texas and the final speaker of the session, discussed public health and equity during pandemic. He stated that climate change and COVID-19 are a dual challenge, and the most vulnerable groups in terms of climate change are also the most adversely impacted groups during COVID-19. The vulnerable groups include low-income communities in developing countries and communities of color in developed countries.

He also discussed how climate change strategies can conflict with COVID-19 containment measures and city plans incorporating nature-based solutions can improve resilience to both COVID-19 and Climate Change, offering co-benefits for health and well-being.

Recommendations

- Cities must include green recovery packages and have equitable access to health
- Increased digitization is required in the industrial sector, civic services, education, and health

- Climate action & designing adaption measures must include representation from the most vulnerable groups
- An active, hands-on administration and use of mapping helps in controlling the severity of the pandemic.



TECHNICAL SESSION III: COVID-19, URBAN HOUSING AND SPATIAL PLANNING

SESSION SUMMARY

Dr. Joan Fitzgerald, professor at School of Public Policy & Urban Affairs, Northwestern University, presented the linkages between housing, climate change and COVID. People living in overcrowded housing, are unable to practice physical distancing or isolation when required, subjecting themselves to a higher risk of exposure to COVID-19. These people are mainly belonging to low income communities. These problems are directly connected to income polarization, a problem that exists in every country. Prof Fitzgerald's studies conducted before COVID-19 examined interlinkages between adaptation and mitigation, where adaptation included land use and flood control interventions whereas mitigation included energy efficiency and renewable energy integration initiatives. She suggested that the middle path could be green infrastructure. Concerted efforts are needed to fulfill our mitigation and adaptation goals, which shall improve public health. She explained that policymakers need to address green affordable housing and connect mitigation and adaptation and health. According to her, this could be done through retrofitting and switching from fossil fuels to renewable energy.

Mr. Hem Chettri, Municipal Commissioner of Gangtok Municipal Corporation, discussed the corporation's experiences in managing COVID-19. The lockdown had adverse economic, social and mental impacts on people's lives. Tourism forms the backbone of the city's economy and was adversely impacted during the pandemic. The government provided some relief measures

like food packages, nominal financial assistance, etc. that weren't effective long-term measures. There was a deep social impact and mental impact on the masses from isolation amidst the pandemic. GMC did thorough sanitization drives, regulated marketplaces, and cremation of dead bodies. The mass cremations dealt a severe blow to the mental health of the GMC's employees.

Mr. Ashish Verma, presented a video explaining the work carried out at the International Urban and Regional Cooperation (IURC). They focus on delivering the 2030 Agenda for Sustainable Development, the United Nations New Urban Agenda, the European Green Deal and the Urban Agenda for the European Union. Various cities cooperate to move towards a sustainable urban development, post COVID-19 recovery, smart cities, mobility, public spaces, energy transition, circular economy, urban food systems, urban industries, culture, education, and tourism. The cross-cutting challenges include climate change, COVID-19 recovery and digital transition. The IURC is based on a Quadruple-Helix cooperation model, encouraging the public sector to work with businesses, research, education and civil society to develop pilot projects in the short term. Activities are based on a win-win perspective for cities in EU and non-EU countries.

Dr. Marino Cavallo, presented a recovery plan for EU, illustrating how cities can work together to use the pandemic period to reshape the economy; to mainstream green economy and green deal. The Green Deal is an integrated way to consider the economy as a part of the solution for the climate crisis and an opportunity to improve technologies. He also discussed that embodying circular economy means working in activities that combat climate change, urban regeneration, sustainable

tourism, green infrastructure and ecosystem services, social inclusion and relation with technologies, smart and sustainable cities, use of big data, new kinds of mobility and use of renewable energy.

- Creating planning and policy frameworks that minimize the adverse impacts of disasters/ crisis.

Recommendations

- Initiate a convergence of research areas like public health, affordable housing, and the climate crisis



QUESTION AND ANSWER SESSION

Question: How easy is it for the municipal corporations to shift people from personal vehicles to bicycling or other modes of transportation? Did this shift happen during the pandemic or after the pandemic?

Answer: They did not have to ask people to stop using public transportation; people did not have a choice. There was some shift from public vehicles to private vehicles due to the apprehension of spreading disease through public vehicles.

Question: When cities have electric buses, why are charging stations not powered by renewable energy?

Answer: Renewable energy is not used for charging railways or other modes of transportation. There are a few sections and places where renewable energy is being used. The technology is at an infant stage and evolving. Maybe in coming years, renewable sources will also be used for charging, but it is unlikely that the entire energy demand would be satisfied by renewables.

Question: Was population density related to the spread of COVID-19 in Surat?

Answer: Initially, there was some effect of the population density, but once the initial infection started, the spread was not directly related to the density. Density was just one of the factors, but it was not the prominent factor.

Question: What are the specific things you would want the researchers to look into regarding the COVID-climate crisis connection?

Answer: Study on the change in the spread and intensity of disease, study of other factors apart

from population density, factors like the cultural and socio-economic aspects related to the spread and intensity of the disease need to be better understood.

Question: What is the impact of COVID-19 and climate change on diverse identities like gender, comorbidities, and disabilities?

Answer: The pandemic was a threat multiplier and exacerbated the issues related to gender. The stress put on the critical infrastructure was high and this increased the vulnerabilities.

Question: How was door-to-door solid waste collection affected during COVID-19 at its peak?

Answer: During the lockdown, it was difficult for safai-mitras to collect waste, especially from COVID positive households. The government had a week-long online training classes for sanitary inspectors, fire department and safai-mitras with regards to the precautions and measures to be taken while collecting garbage from COVID positive households. They were given PPE kits, gloves, masks, and shields by the Government of Rajasthan. Door-to-Door collection was done every alternate day and infected households were tagged for additional safety. Various departments coordinated in this effort.

Question: What are the reasons for differing scales of solutions for climate change and COVID-19?

Answer: The differing scales of solutions showed overlap. Local differences can reverberate outwards. In the USA, in terms of climate change, there are local solutions and national level solutions, and often local solutions are permeating outwards. Similarly, there are local COVID-19 policies which sometimes trump over national policies. They should work together.

Question: This was with regards to the data infrastructure which could be used for future inferences. What did they think about such infrastructures? Should they be available to the public?

Answer: A reason for not publishing data was mainly due to concerns around data privacy. But there is a lack of data democracy, and the citizens could truly benefit from having data freely available. The community is the key to getting high quality data; for example, infrastructure data for Surat is available on the Ministry's online portal. Local government ensured data was readily available to officials and researchers to assess the bandwidth of the problem.

Question: What are the challenges and solutions for digital carbon footprint, especially in a country like India which has an increasing focus on smart cities. How do they avoid negative externalities in smart cities?

Answer: Privacy is a major concern in matters of digital footprints. Cities must invest in multi-utility and multi-beneficial infrastructures which helps us in creating synergies.

Question: How far cities have been able to engage stakeholders in decision making?

Answer: A certain level of disconnect between various stakeholders and conflicting priorities exists in urban India. With regard to the government, the connection is established as the municipal corporations and state government are working together on the same project.

Question: The economy of Gangtok relies heavily on tourism. What steps were taken to

create alternative employment and revive the local economy?

Answer: Gangtok had learnt this lesson from the pandemic. Accordingly, the government has created an Economic Revival Committee which is working on plans and policies for emergency and long-term solutions.

Question: How far do global urgency messages regarding climate change reach the masses and how does one deal with effective communication?

Answer: Climate change is real and was impacting the city and regions everywhere adversely. A panelist mentioned he had never witnessed such heavy rains in decades, the roads were getting flooded and daily life was hampered. They needed to act now through finding causes, prioritizing needs and having policies to contain this issue.

Question: How far has gender representation mainstreamed in decision-making?

Answer: Responding to the question about gender, a panelist said that almost 70 to 80% of the city mayors were females. Yet this was not about gender; instead, it was about creating awareness and strengthening capacities. This can have a big impact on policy making decisions.

Question: How will city managers build a climate resilient smart city in a post pandemic situation?

Answer: A panelist responded that they were working towards an integrated city and developing a city system which monitors in real time different factors causing pollution. Their main problem is the use of the extensive data and the possibility to aggregate and synthesize the same in a quick time. Another panelist

commented that the idea of the circular city mirrored that of Indian cities with common priorities and challenges and there were several lessons to share on platforms such as this workshop.



CASE STUDIES

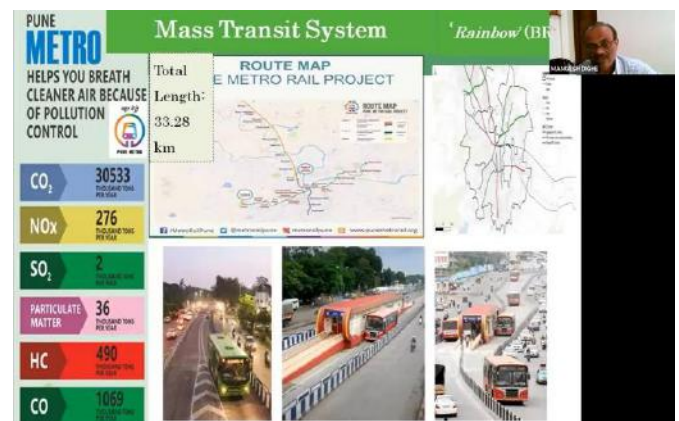
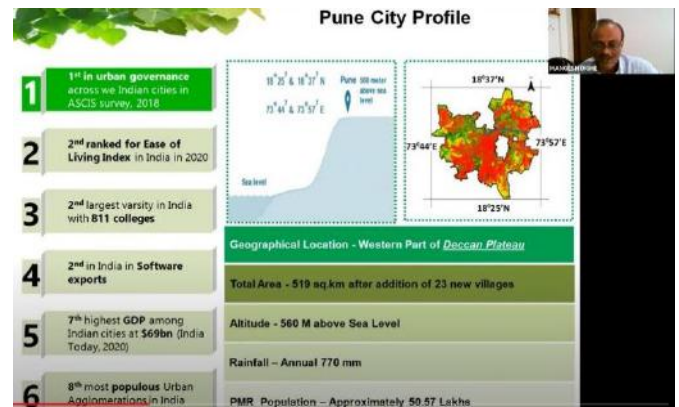
CASE STUDY 1: SHIFT TO SUSTAINABLE MOBILITY IN PUNE, MAHARASHTRA

Pune, a city in the western India, with a population of 10 million ranks second in the Ease of Living index (2020). It also received a 4-star rating in climate-smart city assessment framework in 2021. During the lockdown PM 10 concentrations fell from 80 to 60 micrograms per cubic meter, almost touching the levels prescribed by the Central Pollution Control Board (CPCB). NO₂ also fell from 14.5 to 6.2 parts per billion between March 2020 and April 2020. PMC aims to sustain this trend and reduce emission by another 30%.

PMC focuses mainly on urban transport to achieve this. Some salient features of Pune's sustainable mobility plan include, integrating several sustainable transport modes like public transport (city buses and BRTS), intermediate public transport (shared and private auto-rickshaws) and non-motorized transport (especially cycling), transitioning 25% of its existing bus fleet to electric buses (150 electric buses already functioning and another 150 procured), expanding BRTS network, aggressively promoting 31km long Metro network, subsidizing a more sustainable IPT fleet (CNG auto-rickshaws) and prioritizing non-motorized transport with programs and plans like Pune Bicycle Masterplan. Apart from massive GHG emission reduction from 15 million vehicle kilometers travelled (VKT) on electric buses, other benefits include reduction in air & noise pollution and a mode shift to public transport.

As the pandemic drew attention to the need of safe and healthy cities, other sustainability initiatives in the city include widespread

adoption of solar energy, rainwater harvesting and vermicomposting at the neighborhood level. Pune is also working to expand its dry-waste processing capacity from 1050 million tons to 2475 million tons. PMC also promotes numerous green initiatives like Tree Senses, that survey & maintain 40 lakh trees in the city.



CASE STUDY 2: CHALLENGES OF OPERATING PUBLIC TRANSPORT IN SURAT, GUJARAT

Surat, one of the fastest growing cities in India, with a population of 7 million, recorded drastic changes in mobility demand during the past year. The pandemic also brought shift in mobility demands, with 86% footfall reduction in the retail and recreation sector, 68% reduction in parks, 66% reduction at transit stations, 51% reduction in grocery and pharmacy and 41% reductions in workplaces. Since people were confined within their

neighborhoods during the lockdown, a 22% in footfall was recorded in the residential areas.

The city also struggled to sustain its transit ridership during and post pandemic, and transit revenue dipped drastically. With capital costs unchanged, the Viability Gap Funding (VGF) increased by 69%. Even after reducing the capital costs by 4%, traffic revenue continued to reduce by 48%. Other financial management challenges included providing staff salaries, fuel and maintenance expenses, capital to timely pay operators and procuring safety equipment. In addition to this, operational and service delivery challenges like service planning for uncertain demand, crowd management inside the buses and transit stops, difficulty in flexible scheduling, training staff to ensure social distancing and regular sanitation of buses and stations, further curtailed transit ridership and resulting in lower revenue collection.



CASE STUDY 3: JAIPUR'S RAMGANJ MODEL OF SANITATION & BHILWARA MODEL OF INFECTION CONTAINMENT

The Bhilwara Model for tracing and containing infections was appreciated and widely adopted across the nation. The administration became active immediately after first few cases were reported and issued a strict lockdown in the entire district. The authorities established six control rooms in the area operating round the clock. This was followed by thorough hotspots mapping, aggressive contact tracing and door-to-door testing. The identified hotspots were treated as epicenters and buffer zones around them were identified; apart from barricading the epicenters and introducing a “no-movement order” in the buffer zones, door-to-door testing for each community member of the containment zone was followed. Massive awareness campaigns on preventing and curbing the spread of COVID-19 followed in forms of publications in local languages, jingles and songs, small skits, and public announcements via loud-speakers. The containment zones and other vulnerable communities were provided food packets and other essential goods.

The Ramganj model was another successful model on handling the crisis in informal settlements. Ramganj is Jaipur's one of the most densely populated informal housing area that faced acute challenges of sanitation and solid-waste management, along with challenges of over-crowding and ventilation. During the peak of the pandemic, Ramganj reported over hundred cases a day. Entire area was divided into clusters; these clusters were classified into 3 stages, each with a different level of severity. For Stage 1 clusters, the JMC implemented strict curfew, intensive surveillance, testing and

contact tracing, treated all patients that tested positive. For Stage 2, a more intensive and active surveillance and testing was implemented, only symptomatic patients were treated, out of which, all low-risk patients were treated at home, while high risk patients were moved to institutional facilities. For Stage 3, a strict curfew with IP column 144 was implemented, and focus shifted to reducing mortality. A lot of institutional resources were used for Stage 3, including oxygen stations, rampant testing and treatment shelters, etc. Throughout the process, acute attention was paid to sanitation and solid-waste management. All sanitation workers including sanitary inspectors along with firemen and policemen took rigorous online training on COVID-19 prevention, safety precautions. They were mandated to work with appropriate equipment like PPE kits, gloves, face masks and shield. The sanitation staff regularly surveyed the households and marked households with COVID-19 patients. With the support of all other departments in Jaipur, this model ensured successful door-to-door collection of solid waste on at least an alternate day basis.

How Jaipur's walled city area Ramganj fought the battle against Covid-19

- An example of successfully overcoming the challenges, facing initial resistance from the community to building trust, from creating awareness to imposing curfew, from testing to saving lives, the outbreak in this socio-demographically challenging urban area was a herculean task for authorities.

DIFFERENT AREA, DIFFERENT APPROACH	
Cluster (fewer than 15 cases) Relaxed curfew, intense active and passive surveillance, intense testing, contact tracing, treating positive cases, quarantine at institutional facility	Cluster and Stage 1, patients with low risk quarantined at home and high risk at institutional facility, only symptomatic patients treated
Stage 1 (15 to 50 cases) Stricter curfew than cluster stage. All the rest same as Cluster stage	Stage 2 (Over 150 cases) Testing high risk groups only, focus on preventing deaths, very strict curfew, contact tracing not important, active surveillance of high risk groups, low risk cases quarantined at home and high
Stage 2 (50 to 150 cases) More stricter curfew, active	slightly relaxed, passive
symptomatic patients treated	surveillance, active surveillance

Success key of Bhilwara Model: two-pronged approach was adopted.

Isolating the district

In the first phase, starting 20 March, five days before the nationwide lockdown, a curfew under Section 144 of the Code of Criminal Procedure (making gatherings of five or more persons unlawful) was imposed in Bhilwara district, and only essential services were allowed to open. City and district borders were sealed immediately, with check-posts set up at all entry/exit points.

Covid-19 epicentres were established in the district and the buffer areas were converted into a no-movement zone.

Cluster-mapping, disinfecting and quarantine

Alongside the aggressive testing and contact tracing, the district administration went about disinfecting every nook and corner of the city — from all containment and buffer zones, to localities where positive cases have been detected, to all ambulances and police vehicles, screening centres and quarantine centres, the collectorate, police stations and other public dealing offices.

A rigorous screening strategy was also adopted, prioritizing the affected epicenters, as well as the migratory population

Six 24x7 control rooms were set up in the city, including at the collectorate, chief medical and health office, nagar parishad and sub divisional office.

ANNEXURE

LIST OF PARTICIPANTS

Sr. No.	Name	Designation
1	PR Shukla	IPCC WGIII Co-Chair, GCEE
2	Cynthia Rosenzweig	Senior Research Scientist, NASA Goddard Institute for Space Studies, Columbia University
3	William Solecki	Professor, City University of NY
4	Pankaj Chandra	Vice Chancellor, Ahmedabad University
5	Purvi Vyas	Science Officer, IPCC WGIII TSU
6	Minal Pathak	Senior Scientist, IPCC WGIII TSU and Director, South Asia Hub UCCRN
7	Panagiotis Karamanos	Team Leader, IURC
8	Shwetal Shah	Technical Advisor, Govt of Gujarat
9	Darshini Mahadevia	Associate Dean and CLA, COVID Element, ARC 3.3
10	Yakubu Bununu	Lecturer and LA COVID Element, ARC 3.3
11	Mangesh Dighe	Environmental Conservation Officer
12	Rajesh Pandya	Advisor, Surat city Municipal Corporation
13	Sajad Ahmad Tantrey	Srinagar city Municipal Corporation
14	Kamlesh Yagnik	Chief Resilience Officer
15	Himani Tiwari	Officer, Directorate of Local Bodies, State Government of Rajasthan
16	Shishir Pankaj	Deputy Commissioner, Gwalior Municipal Commissioner
17	Kevin Lanza	Assistant Professor
18	Joan Fitzgerald	Professor
19	Marino Cavallo	Adjunct Professor
20	Hem Chettri	Commissioner, Gangtok Municipal Corporation
21	Ashish Verma	Senior Expert
22	Bhargav Adhvaryu	Professor
23	Shrutika Parihar	Doctoral Candidate
24	Abhishu Oza	Student
25	Aditya Vaishya	Assistant Professor
26	Akash Deb	Teaching Assistant
27	Ashini Kedia	Teaching Assistant
28	Asmita Gattamraju	Student
29	Bihag Dave	Doctoral Student
30	Gaurav Bhattacharya	Professor
31	Kingsuk Jana	Teaching Assistant
32	Kopal Agrawal	Doctoral Student
33	Manvendra Rajvanshi	Teaching Assistant
34	Mausami Dave	Teaching Assistant
35	Munzerin Qureshi	Teaching Assistant
36	Yash Dahima	Teaching Assistant
37	Yashaswini Gadhvi	Teaching Assistant
38	Aryaman Shrivastava	Student
39	Kaushik Jana	Assistant Professor

40	Rajsee Joshi	Student
41	Maahira Nagri	Student
42	Vadivel	Doctoral Student
43	Supratim Dasgupta	Professor
44	Chaitali Joshi	Assistant Professor
45	Ravi Kumar	Student
46	Omkar Gupta	Student
47	Afsane Moeeni	Student
48	Anuj Ghanekar	Social Anthropologist
49	Pranav Singh	City Head
50	Pooja Sharma	Student
51	Bhavya Patodi	Student
52	Vidya Pancholi	Research and Teaching Professional
53	Rohit Nautiyal	Student
54	Ansab Amin	Assistant Architect
55	Sanket Patil	Student
56	Jyoti Maheshwari	Research Associate
57	Gaurav Bhattacharya	Professor
58	Shishir Raval	Professor
59	Anurag Gupta	Research Associate
60	Kaushal Jajoo	Research Associate
61	Prerana Vats	Teaching Assistant
62	Rameshwar Bhatt	Student
63	Siddhi Mehta	Assistant Infrastructure Planner
64	Srutisri Sundaram	Student
65	Vaishnavi KM	Student
66	Veena Shirsat	Student



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