



Mumbai first reports on  
all the climate conferences  
from 2020-2023,  
air quality activities etc.



# M I S S I O N

E N V I R O N M E N T





## CHAIRMAN'S STATEMENT



We firmly believe, the greatest challenge of our era is environmental degradation and we have seen many examples of this around the world. I am reminded of the words of the President of Brazil, Mr. Luiz Inacio Lula da Siva, who recently observed “Climate Change is not a joke, we have to urgently take care of our planet”. Yes indeed, we must act now & act fast as time and tide waits for no one.



Climate Change has rapidly become the single largest threat to mankind in a very short period of time. Having overtaken all predicted scenarios, the term Climate Emergency is more appropriate to describe the times we live in. In the wake of unprecedented climate disasters, climate change has rapidly taken root in the global consciousness and the desire to act, is stronger than ever before, across governments and citizens. This was amply demonstrated at COP26 and COP27.

The recent science shows that the challenges are more severe than what we imagined. Mitigation of the impact of climate change, requires serious and urgent efforts at all levels. After all, we have an unwritten commitment to our own future generations and we need to do everything possible from our side to leave behind a city that is livable at least, if not a better one.

The Stern Committee Report of 2006 and subsequent national and international studies, continue to remind us that coastal cities are extremely vulnerable to sea-water temperature rise, and sea levels will continue to rise during the 21st century and several coastal cities like Mumbai, Bangkok, Hong Kong, Tokyo, Bangladesh, Jakarta and others, will be most vulnerable, affecting lives of millions of people and assets worth trillions of dollars.

The total urban population at risk from sea-level rise, could be over 800 million people living in 570 cities by 2050. Mumbai too is said to witness an increase in sea level, affecting its infrastructure, business, economy and the lives of nearly 2-3 million people living within 1 km of the coastal line. We are very concerned about Mumbai and in the Silver Jubilee Year of Mumbai First, we identified “Climate Action” as one of our core themes. Mumbai is extremely vulnerable to the impact of climate change due to hypsographical location and rapid urbanization.

The floods of 2005 in Mumbai – should have been a wake-up call. Now, extreme heat days, severe rainfall, floods are more likely than ever, to be part of life for Mumbaikars. The Mumbai monsoon patterns have changed. There are more extreme rainfall days now, than 10 years ago. Sea-water levels have been rising and the risk of coastal floods and cyclones are real. Nearly 40% of Mumbai could be under water by 2050.

A recent report indicated that coastal erosion in Mumbai and MMR, is taking place at a much faster rate than anticipated earlier and if something is not done promptly, Marine Drive and other coastal areas are at a risk of sinking in 20 years, that is, by 2050. Apart from coastal flooding, damaging assets worth trillions of dollars and lives of millions of people will be affected.

Continuing our initiative and in line with the G20 key focus, “Climate change and sustainable development, including socio-economic issues at the nexus of the Sustainable Development Goals”, we organized “**Global Coastal Cities Summit**” in May 2023 and brought together experts, bureaucrats, and climate scientists to devise strategies for sustainable and resilient coastal cities. The conference was supported by the Government of Maharashtra, European Union, World Bank, Resilient First (London), Kingdom of Netherlands, Asian Development Bank, amongst others.

The importance of mobilizing finance for climate-resilient coastal regions cannot be overstated. The International Conference on “**Climate Crisis 2.0**” in May 2022, was a significant step towards this endeavor.

The “ **Climate Crisis: Action for Tropical Coastal Cities**” conference in February 2020 made clear the imperative for a Special Climate Change Task Force in Maharashtra, which can develop environmental knowledge systems for data management, climate forecasting, policy-making, and mitigation planning.

During the winter of 2022-23, Mumbai had the distinction of being the most polluted city in the world. As public concerns around air quality in the city reached a crescendo, we convened multiple roundtables with experts and officials directly involved in responding to the situation, were able to present some possible solutions.

We recognize that the challenges are formidable, and we hope that the recommendations, following our three conferences which are presented in this publication, will help cities to take appropriate proactive steps to meet the challenges of climatic disasters.

I would like to take this opportunity to express my gratitude to the Government of Maharashtra, European Union, World Bank, Kingdom of Netherlands, Resilience First (London) and our other partners who supported us.

Kind regards.

**Narinder Nayar**

Chairman – Mumbai First



# GLOBAL COASTAL CITIES SUMMIT



Building & Developing Sustainable  
& Resilient Coastal Metropolises - May 30, 2023

Coastal cities confront numerous challenges, including rising sea levels, extreme weather events, rapid urbanization, and environmental degradation. These demand immediate attention and integrated solutions.

With this in mind, the GCCS was held at the Taj Mahal Palace in Mumbai to devise strategies for coastal resilience, sustainability, and adaptation globally. The summit gathered stakeholders from multiple countries, from bureaucrats to climate scientists, among others.



## The summit yielded several key recommendations:

- **Building Resilient Infrastructure:** Incorporate climate change considerations in infrastructure design, promote nature-based solutions, and encourage sustainable building materials.
- **Implementing Climate Change Adaptation Measures:** Conduct vulnerability assessments, develop adaptation plans, and integrate climate considerations into land-use planning.
- **Promoting Sustainable Urban Development:** Encourage compact, mixed-use development, and sustainable transportation options.
- **Strengthening Governance and Collaboration:** Establish integrated coastal zone management frameworks and promote public-private partnerships.
- **Enhancing Disaster Preparedness and Response:** Invest in early warning systems, training, and disaster risk financing.
- **Implementation Strategies:** To ensure effective policy implementation, strategies like integrated coastal zone management, public-private partnerships, capacity building, financial support, and monitoring are proposed.

By adopting these strategies, coastal cities including Mumbai can mobilize resources, empower stakeholders, secure funding, and track their progress in solving these challenges. The goal is to incorporate climate considerations and create sustainable environments for current and future generations.



**Resilience First (London), associate member, Mumbai First hosted a parallel second edition of the Engineering Leadership Group Executive Roundtable (ELG Roundtable).**

- The ELG Roundtable gathered global engineering-inclusive organizations.
- It focused on urban infrastructure’s role building resilient net-zero economies.
- The roundtable urged G20 governments to collaborate with private-sector engineering organizations.
- They called for policies to expedite the development/deployment of low-carbon technologies.
- The aim was to enhance financially viable decarbonization pathways for sustainable economic growth and climate resilience.



## CLIMATE CRISIS 2.0



Mobilizing Finance for Coastal Cities - May 12-13, 2022

Climate Change, linked to global warming, poses a significant 21st-century challenge. The latest IPCC reports (AR-5 & AR-6) highlight a record temperature increase since 1850, with a 0.87°C rise during 2006-2015. This increase results from human activities, impacting sea levels, temperatures, heatwaves, and heavy precipitation.

**Coastal cities like Mumbai, Kolkata, and Chennai, home to a fifth of India's population, face climate change risks, including flooding and cyclones. India has experienced extreme weather events like floods, landslides, and erratic monsoons, affecting over a billion people.**



Addressing climate change requires an inclusive, sustainable approach involving public-private collaboration. Mumbai First organized the International Conference on Climate Crisis 2.0 in May 2022, bringing together global experts in collaboration with the Municipal Corporation of Greater Mumbai, The European Union, The Mumbai Climate Action Plan, Maharashtra's Majhi Vasundhara initiative, the Consulate General of the Kingdom of Netherlands, and Mckinsey India.

**This event aimed to mobilize finance for climate-resilient coastal regions, share knowledge, and forge partnerships between governments and the private sector.**

The conference engaged stakeholders from various sectors and nations, facilitating networking and strategy exchange. It provided insights into climate solutions, risk management, & innovative financing, fostering collaboration with global climate leaders.

## Here are the key learnings from the two day conference:

- A single planning authority headed by a political leader is needed for coordinated efforts for climate change.
- Current and future investment projects should be evaluated on resilience.
- Involvement of local bodies and citizens in incentivizing climate actions is needed.
- The environment vs. development debate needs to be recast as 'environment vs survival'.
- City governments need to take action and engage in solution-finding.
- Environmental plans formulated by the private sectors must be considered.
- Mumbai must learn from steps taken by global coastal countries, and adopt technological innovations.
- The environment has become a central theme in multilateral and bilateral lending agencies.
- Collaboration between government and the private sector is required.
- A 6:1 cost-benefit ratio will be obtained through proper investments for the climate change risks.



## The way forward:

- Developing a single governmental agency for the concerted efforts and impact of climate, i.e a national-level coordinated authority with a concerted action plan.
- change in the city of Mumbai.
- National level body akin to GST council to deliberate and arbitrate on all environmental aspects as one country for equitable use of resources.
- New urbanism policy development.
- Empowering city wards neighbourhood councils.
- Creation of green exchanges and financing, i.e. carbon credit markets, blue markets, etc.
- Capacity building to access knowledge.
- Appointment of a Chief Resilience or Chief Risk officer in at a city level to identify and mitigate climate risks.
- Promote public transportation.
- To create venture funds among local citizens for environmental conservation.





# CLIMATE CRISIS



## Action for Tropical Coastal Cities – February 27-29, 2020

The 'Climate Crisis: Action for Tropical Coastal Cities' conference addressed India's vulnerability to climate change, India, with its extensive coastline, diverse terrain, & large vulnerable population, faces severe impacts including heavy rainfall, floods, & heatwaves.

Against this background, and a 151% increase in the economic cost of climate-related disasters globally over a decade, Mumbai anticipates a 25% increase in flash-flood intensity, 78% in flood depth, and 15% in flooded areas by 2050, posing risks to its infrastructure and population. Without mitigation, associated costs could compound at USD 900 million every 5 years until 2050.



### **Mumbai First involved local authorities, scientists, healthcare professionals, NGOs, academics, and other stakeholders and has made these key recommendations:**

- Establishing a centralized data center for climate data collection and monitoring.
- Building local capacity for disaster management.
- Constructing sea walls based on sea level data to protect against rising tides & storm surges.
- Allocating capital for climate change interventions, adaptation policies, and research.
- Implementing flood management and forecasting, particularly in vulnerable regions.
- Upgrading climate-vulnerable transport infrastructure for resilience and reduced greenhouse gas emissions.
- Estimating and reducing GHG emissions through real-time modeling.
- Developing an evacuation plan and citizen training.
- Improving urban water use through recycling, efficiency, groundwater recharge, and regulation revisions.
- Protecting urban agriculture and forests for carbon reduction, economic opportunities, and food security.
- The establishment of a multidisciplinary Special Climate Change Task Force in Maharashtra, chaired by the Principal Secretary of Environment and Climate Change. This task force would focus on developing an environmental knowledge system for data management, climate forecasting, policy-making, and mitigation planning, ultimately informing the creation of a climate change mitigation plan for the city and region

# AIR QUALITY

'Clearing the Air: Strategies for Mitigating Mumbai's Air Quality Issues' -  
April 11, 2023

Led by M. M. Kutty, chairperson, Commission for Air Quality Management  
(National Capital Region)

## Major pollution sources in Mumbai:

- **Vehicular emissions**
- 20-30% of emissions come from vehicles
- CAQM Action Plan:
  - Enforce regular PUC regime
  - Phase out old diesel and petrol vehicles
  - Promote swift adoption of clean fuel (CNG)/EV for public transport
  - Enhanced traffic management
- **Construction and road dust (infrastructure)**
- C&D waste generates 50% of PM10 particles
- Sanjeev Kumar's (AMC) Committee Proposed Measures:
  - Water sprayers and dust suppressants
  - Closed container transportation
  - Web portals for monitoring
  - Strict actions against non-compliant projects
- **Industries & power sector**
- 91% electricity use in industries/power sector
- CAQM Targets:
  - Appointment of CTE/CTOs
  - Strict emission standards
  - Frequent inspections
  - Rigid actions against non-compliant industries
  - Focus on ecologically friendly fuels
- **Waste burning**
- Prohibited by BMC's Solid Waste Management Rules
- Mr. Kutty's Proposed Measures:
  - Identify hotspots and prevent biomass burning
  - Conduct awareness/IEC activities
  - Deploy water tankers
  - Set up portals and control rooms

# INDOOR AIR QUALITY

## What is the solution?

### 1 - 'Source Reduction Centric Approach'

- Elimination of pollution prior to release, recycling, treatment, or disposal.
- Changing the very processes that generate pollution in the first place.

### 2 - Stakeholder Engagement

- Involve industrial/construction agencies and residents' associations.
- Creating a Citizens' Charter for shared responsibility.

## Recommendations for Mumbai's air pollution:

- Implement the Graded Response Action Plan under NCAP with weekly citizen updates.
- Raise public awareness about a local-level committee led by the Municipal Commissioner.
- Issue health advisories as air quality deteriorates.
- Identify air pollution hotspots using wind forecasting.
- Implement micro-level solutions at the ward level.
- Build capacity for ward-level officers.
- Consider the Traffic Restraint Scheme.
- Conduct rapid environment impact assessments for construction.
- Coordinate efforts among BMC, MMRDA, Traffic Police, and MPCB for pollution control.
- Involve industrial/construction agencies and residents' associations.
- Creating a Citizens' Charter for shared responsibility.



### Other takeaways:

- Post-COVID-19 winter 2022: Increased bronchospasm cases due to air infections and allergies, leading to higher inhaler usage.
- Mumbai's growing electric vehicle (EV) adoption with incentives like tax exemptions and vehicle scrapping.
- NCAP targets a 25% reduction in dust emissions by 2025 in 19 Maharashtra cities, including Mumbai.
- Proposals are needed in Mumbai for micro-level solutions, area-wise air quality monitoring, and an adapted Graded Response Action Plan.
- Mumbai's wind patterns and coastal location can be leveraged in some areas, in others with slow wind speeds, it is important to reduce specific sources of pollution.



# INDOOR AIR QUALITY



'Championing Indoor Air Quality Solutions in the Mumbai Metropolitan Region (MMR)' – October 6, 2021

On October 6, 2021, experts were convened by Mumbai First to discuss the significance of indoor air quality (IAQ) solutions in the context of the COVID-19 pandemic.

## Here are the key insights shared by each speaker:

- **Mr. Nitin Goyal, principal scientist, CSIR-NEERI Research & Innovation Centre:**
- CSIR's multifaceted contributions to the COVID-19 fight, including including drug development, testing methods, makeshift hospitals, & provision of essential medical supplies.
- Highlighted risks linked to airborne transmission of COVID-19
- CSIR involved in development of alternative COVID-19 testing methods.
- Sewage surveillance for virus monitoring.
- Critical to build ventilation in indoor healthcare facilities.
  
- **Dr. Anup R. Warriar, consultant, senior physician, diseases and hospital infection control:**
- Presented a current review of IAQ in healthcare settings, outlined measures for hospitals to adopt in the near future
- Pointed out the increased risk to healthcare workers.
- Routine hospital filters have limited efficacy in stopping infections
- Seconded the urgent need for enhanced ventilation.
- Called for faster and more accurate methods to identify pathogens in the air.



- **Dr. (Ar.) Roshni U. Yehuda, environmental architect & academic:**
- Regulating IAQ in educational institutions.
- Challenges in air-conditioned schools.
- Importance of planning spaces with specific guidelines.
- Creating a safe school environment.
- Measures such as communication and health monitoring.

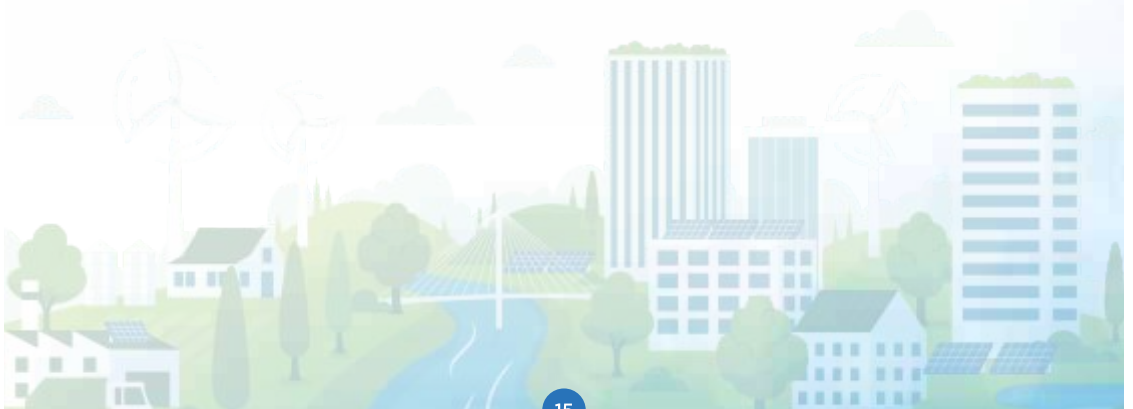
- **Dr. Mala Singh, Founder & MD, PEC Greening, India:**
  - IAQ's significance; 90% of our time spent indoors.
  - Immediate and long-term health effects of poor IAQ.
  - Recommendations for improving IAQ, including green practices.
  - Use of air-cleaning technologies.
  - Regular IAQ monitoring and auditing.
- **Mr. Pravin Rawool, Godrej & Boyce:**
  - Smart infrastructure solutions to tackle IAQ for COVID-19 containment.
  - Monitoring and controlling IAQ as central to risk reduction.
  - The link between health, built environment, and comfort.
  - IAQ improvement methods: filtration, irradiation, and more.
  - Reference to ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) recommendations.



During the Q&A session, topics included addressing poor IAQ in low-cost housing and enhancing CO<sub>2</sub> ventilation coefficient measurements' accuracy for indoor safety, improving ventilation and lighting regulations for affordable housing and the need for comprehensive IAQ evaluations.

In summary, the event highlighted IAQ's critical role in preventing infectious disease transmission and ensuring indoor occupants' health and well-being.











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