



# QUESTION OF CITIES

Forum for nature, people,  
and sustainability®



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## Question of Cities - CANSA Fellowship 2023-24

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# PREFACE

The volume you are holding in your hands is a glimpse into the collaborative effort to tell stories of climate change and cities from countries across South Asia, a continuing exercise that brought environmentalists, researchers, architects, media persons and facilitators together in early 2023. Each story or essay here, published to wide acclaim over this year in the online journal ([questionofcities.org](http://questionofcities.org)) is a part of the fellowship work which continues to be done and will be published through the next year.

The idea was born out of a conversation among old friends, as such ideas usually do, to offer six fellowships across South Asian countries to research, report and write ground-level stories and essays about the impact of climate change. At Question of Cities (QoC), we believed that the U.N. Secretary General António Guterres, while releasing the Intergovernmental Panel on Climate Change (IPCC) report in 2021, had rung the alarm bell once again with his words: “It is a code red for humanity”. The report projected hotter weather, longer monsoon seasons, and increased droughts with an increasing frequency and magnitude of extreme weather events affecting millions in South Asian cities.

Climate Action Network South Asia (CANSA) collaborated to bring these stories to life, with funding from Misereor. The Fellowship call brought us proposals in hundreds from large and small cities across the region. The overwhelming response pointed to the sense of urgency about climate change and urban life. Since then, more than ten rigorously-researched, sensitively-reported and meticulously-edited essays have been published from Bangladesh, India, Pakistan and Nepal. This is only half the work done; the QoC-CANSA Fellows continue their endeavour to bring stories to life.

The six essays in this volume are, at once, specific to the place and people in them but also resonate with the universal or macro concerns about how devastatingly and unequally climate change unfolds in cities. They range from making new cities in ecologically unsustainable ways to the need for green buildings, from the climate impact on the dengue outbreak in Dhaka to the slum dwellers of New Delhi suffering evictions in a super-hot summer, and how gender intersects with the climate crisis. If these spur discussions and actions, our effort would have been worth every minute of it.

Smruti Koppikar  
Founder Editor, QoC

Sanjay Vashist  
Director, CANSA

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# CONTENTS

New cities, old predicaments: Role of planning in climate mitigation <i>Arshiya Syed</i>	6
Rethink Guwahati's building bye-laws for net-zero carbon future <i>Barasha Das and Harish Borah</i>	16
Delhi's heatwave, floods, and G20 beautification force urban poor to pay heavy price <i>Hrushikesh Patil and Sejal Patel</i>	24
Nepal's Melamchi, still recovering from 2021 flood, shows multiple risks of rapid urbanisation <i>Kushal Pokharel and Chhatra Karki</i>	32
As climate-related ailments worsen, Dhaka hospitals fail to serve the poor <i>Sadiqur Rahman</i>	40
Pakistan's women struggle to make voices heard in Climate Change conversations <i>Zofeen T Ebrahim</i>	48
QoC - CANSA Fellows	56



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## **New cities, old predicaments: Role of planning in climate mitigation**

Urban planning and policies play a crucial role in the relationship between cities and the climate crisis. This is evident in the new 'cities' or sub-cities developed around Hyderabad, the latest being Neopolis, in the neoliberal framework where the state acts as a land broker and land is commodified. The 533-acre 'greenfield' near the Osman Sagar reservoir is projected as yet another business district with an overwhelming 90 million square feet but environmental contradictions are ingrained in Neopolis given the change in land use, flattening of complex non-urban environment, and modifications to natural vegetation compromising its natural ecosystem. Such an entrepreneurial approach to planning and governance neglects climate mitigation.

**Arshiya Syed**  
**QoC - CANSA Fellow**  
**Hyderabad, India**

*'What makes a regime distinctive, is where it draws the line between economy and nature, and how it operationalises that division.'* -Nancy Fraser

Urban environments play an active role in causing and intensifying Climate Change phenomena such as increasing temperature, solar radiation, loss of habitat, ecological diversity, and shifting weather patterns. Urban planning and policy that enables this is primarily oriented towards economic growth, and employs drastic changes to the natural environment as the means to achieve this growth. The immediate effects are seen in Urban Heat Island effect, heat waves, reduced vegetation cover, degraded soil quality, air and water pollution, heavy and unpredictable flooding. Urbanisation brings profound physical, environmental, socio-cultural, economic and political changes sharing a reciprocal relation to disaster risk and vulnerabilities due to Climate Change.

The rapid and dramatic transformation of the western periphery of Hyderabad, cast in the image of a 'global city', offers a remarkable window into this. The creation of a new suburb, branded and marketed as 'Neopolis', adjoining the financial district and the IT/ITES hub in Gachibowli, is a case study in the relationship between urban development practices and the natural environment. The knowledge and evidence of the effects of Climate Change long predate these policies and practices of economic growth. This implies an inherent logic embedded in them that make them antithetical to climate resilience.

This essay argues, in two parts, that a deeper understanding of the relationship between cities and the climate crisis leads to the crucial role played by urban planning and policies which are designed to exacerbate – rather than mitigate – Climate Change. A solution lies in rectifying the planning and policy frameworks. It also argues that these practices are not arbitrary or ad hoc occurrences but determined by the neo-liberal logic of unlimited economic

growth and financialisation which currently dominate urban development in India.

### **Neopolis and sub-cities**

On August 3, the Hyderabad Metropolitan Development Authority (HMDA) conducted a digital auction of plots setting a new record for land prices sold at Rs 100 crore per acre. To the government, this price implied the desired progress of urban development justifying land as a critical resource, IT and real estate industries as core segments of the city's economy, and Hyderabad as the preferred destination for investments and offices of national/international corporations.

Christened Neopolis, the hitherto farming site is a 533-acre 'greenfield' development near the Osman Sagar reservoir. Projected as yet another central business district, it is planned for an overwhelming 90 million square feet workspace with employment opportunities for up to seven lakh people within the next decade. The development of Neopolis, at a strategic location, emphasises the provision of public infrastructure, social amenities and cultural institutions. Its commercial and real estate potential is projected to rise because of the proximity to developed parts of the city.

It is also promoted as an exemplar of 'sustainable development' planned around the 'walk to work' concept. However, the relaxation of regulatory frameworks and suspending the existing planning system begin to complete its story. With unlimited Floor Space Index (FSI) and no limits to building height, the marketing of this 'world-class city' is with the explicit aim of attracting developers, investors, and corporate entities. This serves two purposes – directing the IT/ITES development towards southwestern periphery to increase surrounding land prices, and creating a dramatic skyline of a 'global city' driven by speculative urbanism.

The current planning practice reveals a radical shift in urban development aligned to the neoliberal paradigm of the 1990s. The passage of the 74th Amendment Act

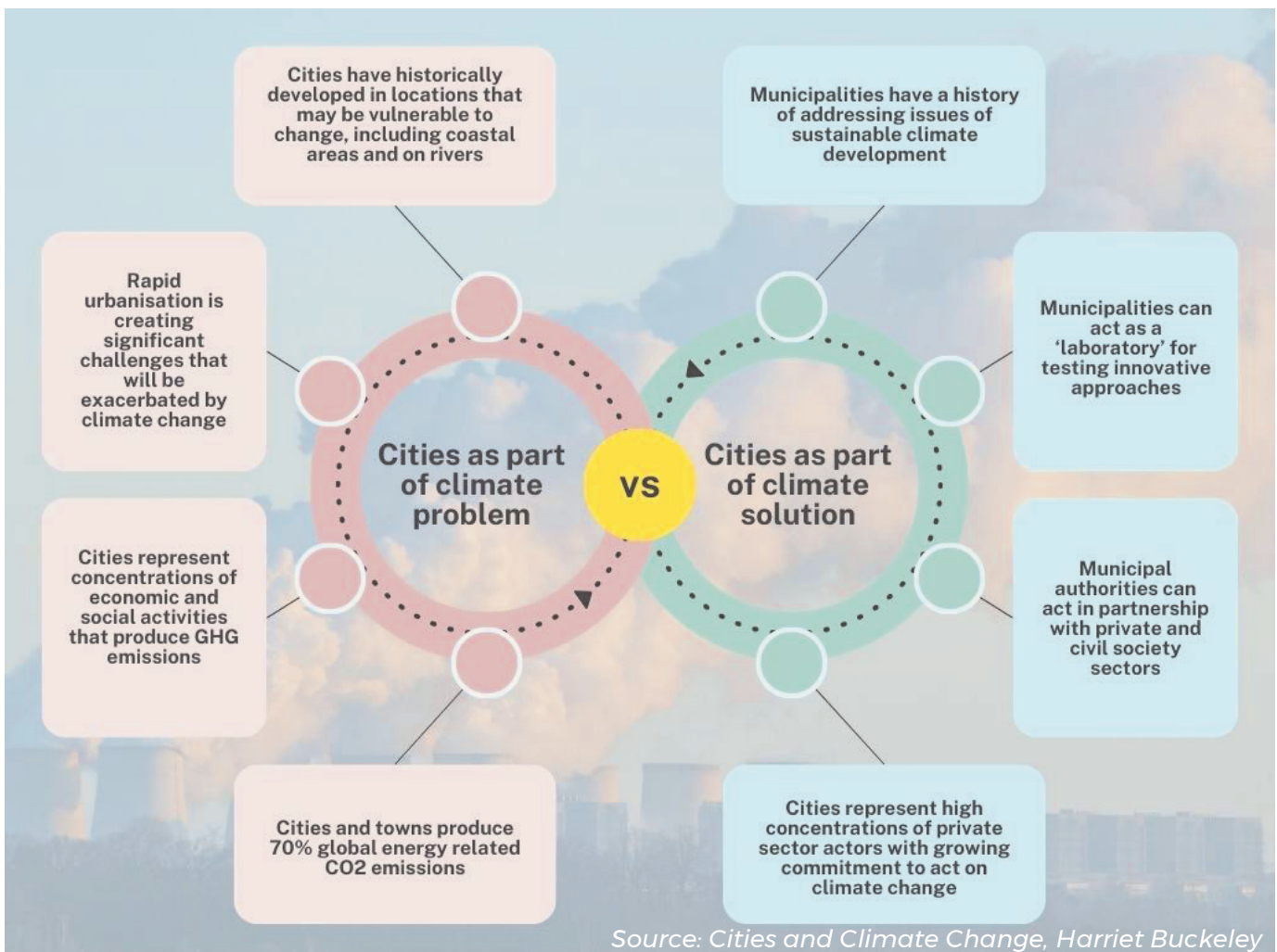
reorganised urban local bodies and devolved power to municipalities. At the same time the 'Andhra Pradesh Vision 2020' identified a set of "growth engines" with an emphasis on the service sector, prioritising the development of IT-related services, biotechnology, tourism, logistics which called for high-quality urban infrastructure (semanticscholar.org).

The state government announced the first ICT (Information & Communications Technology) Policy in 1999 with incentives such as highly subsidised government land reserved for specific industries, zoning exemptions, land use conversion, uninterrupted power supply, tax breaks, registration refunds, and repeal of Urban Land Ceiling and Regulation Act of 1976 to allow industries to hold excess land for future land transactions. In order to create an ecosystem for ease of business, the single window for project approvals was set up. The oversimplified process led to mushrooming of industries around the periphery of Hyderabad (telangana.gov.in).

What began with the development of Gachibowli as the IT hub expanded into adjoining areas and, further, along the new international airport and its associated commercial or industrial zones. These zones surrounding the city have dedicated clusters such as aviation, pharmaceuticals, biotechnology, and IT - all connected by a 158 kilometre eight-lane high-speed, tolled highway called the Outer Ring Road .

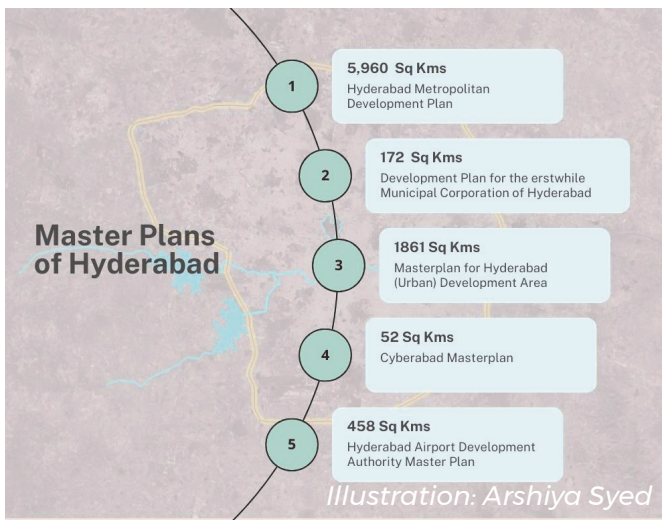
The state thus came to occupy the role of a land broker for capital by appropriating land for private use and creating land banks, by redrawing the city's boundaries and setting up new urban local bodies for governance. At present, Hyderabad is governed by five different Master Plans. (hmda.gov.in).

These plans assembled land parcels with mechanisms such as land pooling schemes, layout development plans, and subdivision or amalgamation of plots, simplifying building regulations and a flexible approach



With Climate Change accelerating, cities need to find sustainable solutions.





unregulated growth of certain areas and develop infrastructure to attract investments. In Hyderabad, such authorities were carved out for select areas with special planning controls and high levels of managerial input, and were combined to create the HMDA in 2008. While this leads to greater functional integration, it has also created a highly fragmented city.

### Problems of new sub-cities

Neopolis, much like its predecessors, exemplifies the process by 'which contemporary urbanisation in India creates variegated and uneven geographies, serving capital accumulation led and deepened by state policies.' (academic.oup.com) It is essential to understand the cause of proliferation of such new cities, and the effects of planning in the context of sustainable development and climate action. It enables an insight into the contradiction of the lived city as an engine of economic growth through infrastructure expansion, and

to construction. This was complemented by the digital self-certification system to acquire building permits, replacing the conventional practice of municipal representatives physically inspecting sites to ensure compliance with building codes and regulations.

The municipality lacks the resources, powers and political will to enforce master plans in their entirety unlike the special development area authorities which can issue permits for



*Photo: Kulsum Nafisa*

*Ongoing development work of Neopolis.*

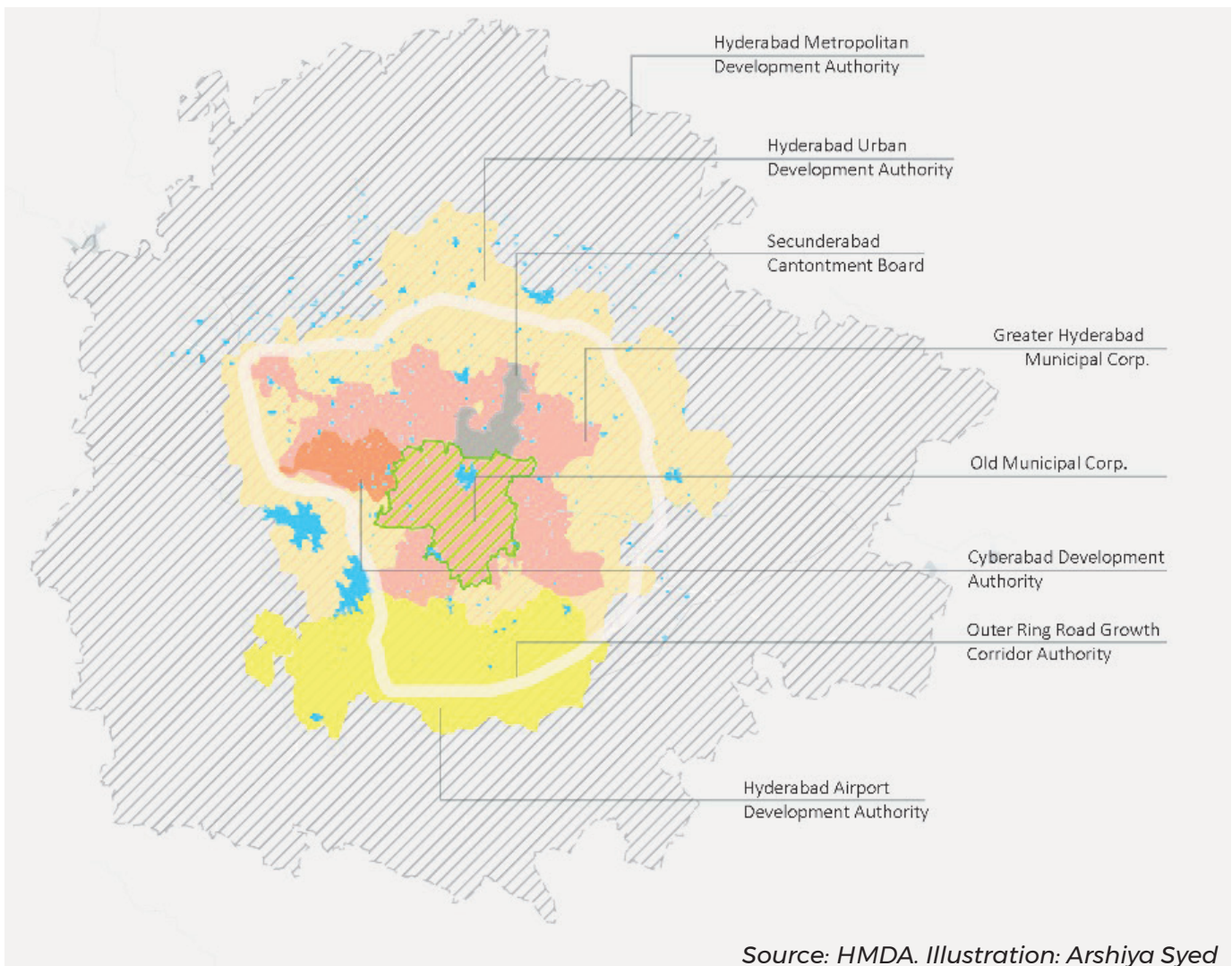
as a site of social and economic breakdown exacerbated by Climate Change. Environmental contradictions are ingrained in developments such as Neopolis. It necessitates change in land use from a complex combination of non-urban environments in the Deccan plateau such as farms, settlements, scrubland, pastures, wooded areas, lakes, streams, hills, rocky outcrops, into a series of standardised plots fit for auction. Modifications to natural vegetation have detrimental effects on the ecosystem's ability to mitigate stormwater runoff, flooding, and absorption, and are also linked to an escalation in heat island effects.

Further, the commodification of land is achieved by coercive displacement of existing farmers, farmworkers, rural artisans, and tribespeople using laws like the Land Acquisition Act. The impact of land loss on the livelihood and economic well-being of rural communities is well-documented; 37

out of the 70 approved Special Economic Zones (SEZs) are located in peri-urban areas around Hyderabad.

The marketing discourse about Neopolis focuses on the brand identity of the enclave, emphasising visual and sensory characteristics such as the skyline, highway interchanges, the presence of international brands as employers and providers of consumer goods, and its globally aspirational nature. Hyderabad is presented primarily as a site of cultural heritage for citizens of Neopolis to consume. While the marketing literature does mention proximity to workplaces and the presence of public transportation, these are neither allowed in any housing policy or regulation, nor in the creation of enabling infrastructure.

The built environment of Neopolis is mainly tall residential buildings, served by car-centric infrastructure, and other resource-intensive



Source: HMDA. Illustration: Arshiya Syed

A bevy of development authorities and their jurisdictions in Hyderabad.



*Photo: Kulsum Nafisa*

*Edge of Neopolis layout towards Osman Sagar reservoir.*

facilities. Exceptionally fertile farmland is being transformed into a series of land banks, while the topography of the land is being altered to create a suitably flat and uniform terrain for roads and utilities. In the process, the rocky hills and scrubland that absorbed and regulated water flow, and sustained a diverse ecosystem, are erased as they are perceived as obstacles to ‘development’ (researchgate.net).

This research found that Neopolis is, therefore, not an organic growth of the city’s spread and density, nor is it a planned city driven by public or state imperatives such as India’s previous planned cities; instead, its establishment and growth are the result of purely profit-driven motives with the economic logic of real estate speculation overriding other motivation. The influence of neoliberal logic of place-making can be clearly seen as the driving force here.

The vast scale of destruction of the Deccan landscape exemplifies the change in planning – from a creative practice to a fundamentally destructive process driven by technological advancements and commoditisation of architecture now fully subsumed within the neo-liberal logic of capital. This involves the notion of efficiencies of scale in the assembly line production of buildings and urban design, in turn leading to the holy grail of increasing profit accumulation. While Neopolis claims to be a sustainable development, it is anything but that.

Such exercise of power by displacement of people to redraw city’s boundaries (Urban Land Acquisition: Certain Emerging Issues, Nilima Verma), sweeping away environmental concerns through administrative fiat ([spi.org/in](http://spi.org/in)) and physically flattening the landscape with earth movers, explosives, and a vast

cheap manual labour drawn from the northern states, all demonstrate the critical role of the neo-liberal state in planning, and by extension, in altering the forms of the physical landscape and ecology. These actions are only possible if the state sees its role primarily as an enabler of capital, and only indirectly as a mechanism for public welfare. For any meaningful understanding of climate action policies and projects, it is therefore crucial to examine the role of the state in crafting urban policy and planning practices.

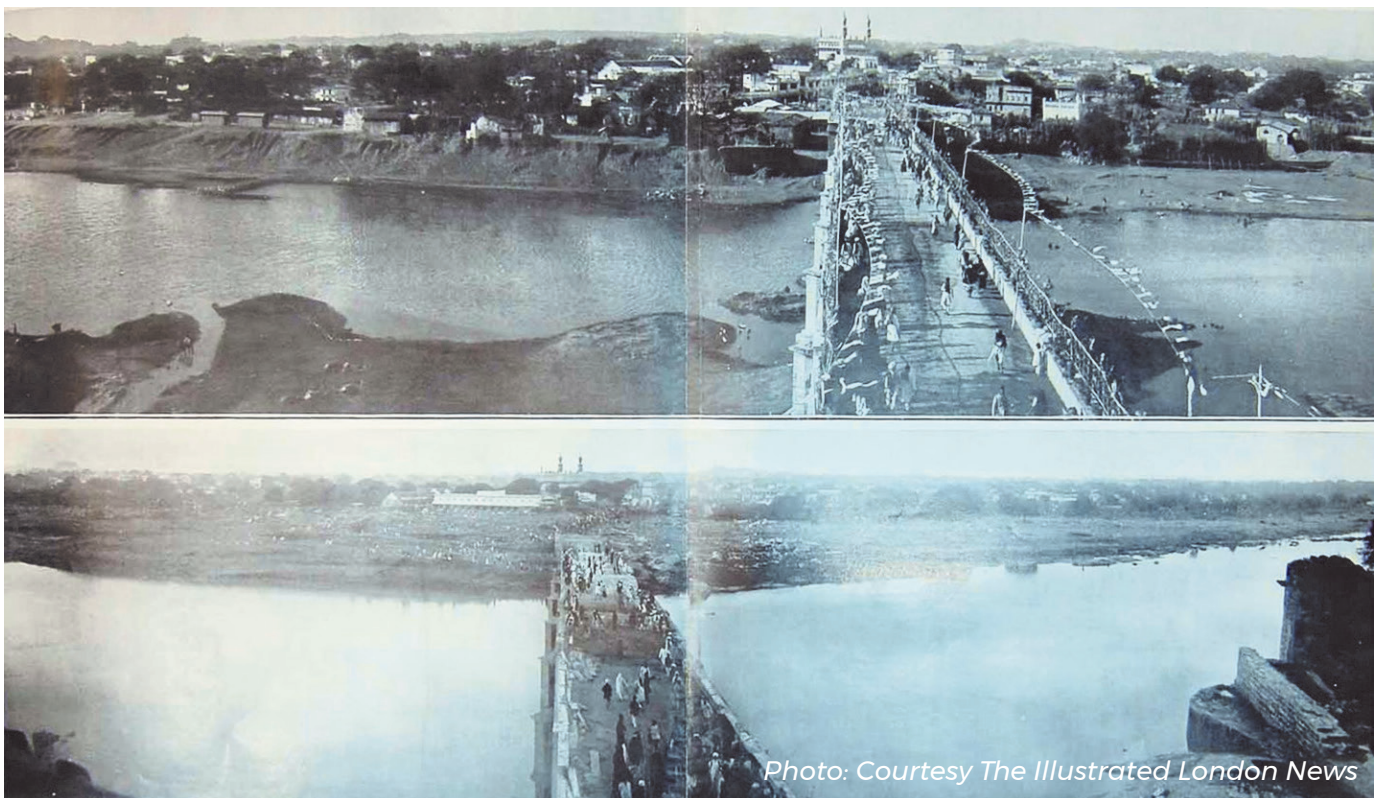
The building of new sub-cities, such as Neopolis, create a narrative that they solve a variety of urban problems while promoting a place and shaping development by unregulated market-oriented growth. The transformation is made possible by appropriating land as an asset for financial accumulation and commodification, rather than as a fundamental resource to constructing affordable housing, and markets, and industries to benefit the people.

While new 'cities' contribute to economic growth and improved living conditions for some people, their negative consequences include social exclusion, spatial

fragmentation, threats to democratic process, and environmental concerns such as Climate Change (sciencedirect.com). There is an absence of recognition of risk embedded in the geomorphology of the city, and limited comprehension of how urbanisation contributes to Climate Change. The entrepreneurial approach to planning and governance continues to neglect climate mitigation even though economic growth is contingent upon the resilience of urban areas (weforum.org).

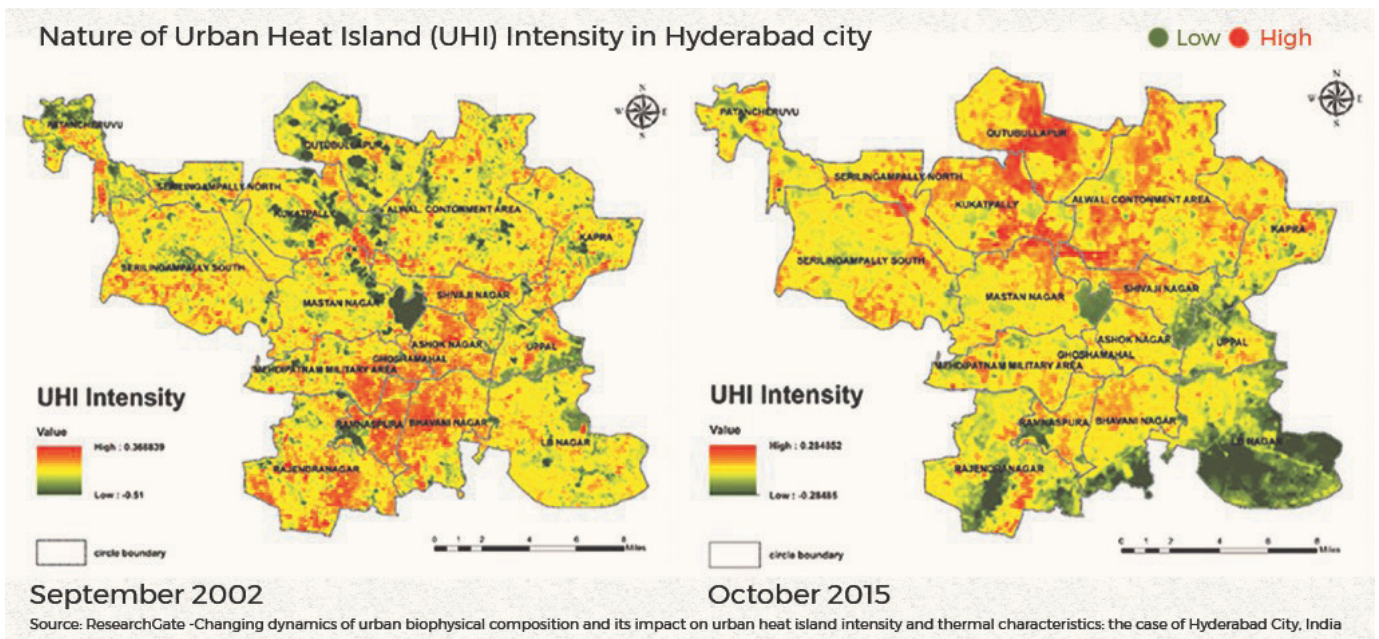
### Climate signals for Hyderabad

Hyderabad is the fourth most populated city with an aggregate population of 10.2 million, and second largest metropolitan area covering 7,257 square kilometres. Hyderabad occupies only 0.6 percent of the total land in Telangana - which is 46.8 percent urbanised - yet houses 20 percent of its population and contributes to over 80 percent of the state's GDP. In comparison, agriculture contributes 16 percent but with 59.6 percent people depending on it. The city is profoundly affected by climate-related events, its risks heightened as in any metropolitan area. Hyderabad has experienced a number of extreme weather events in recent years



View from the damage post 1908 floods on river Musi bank.

Photo: Courtesy The Illustrated London News



Maps showing an increase in Hyderabad's Urban Heat Island Intensity in 2002 and 2015.

including periodic flooding (Indian Express), prolonged heat waves with successive hottest years (Telangana Today), and extended droughts (Hindustan Times) affecting people's health and livelihoods. It was only in early 2020 that the Greater Hyderabad Municipal Corporation reserved 10 percent of its finance for adaptation to 'global warming and climate change' under its Green Budget. Hyderabad is the second city in India to establish a specialised disaster response unit, the Directorate of Enforcement Vigilance and Disaster Management (EVDM), tasked with rescue and relief efforts in the aftermath of a disaster.

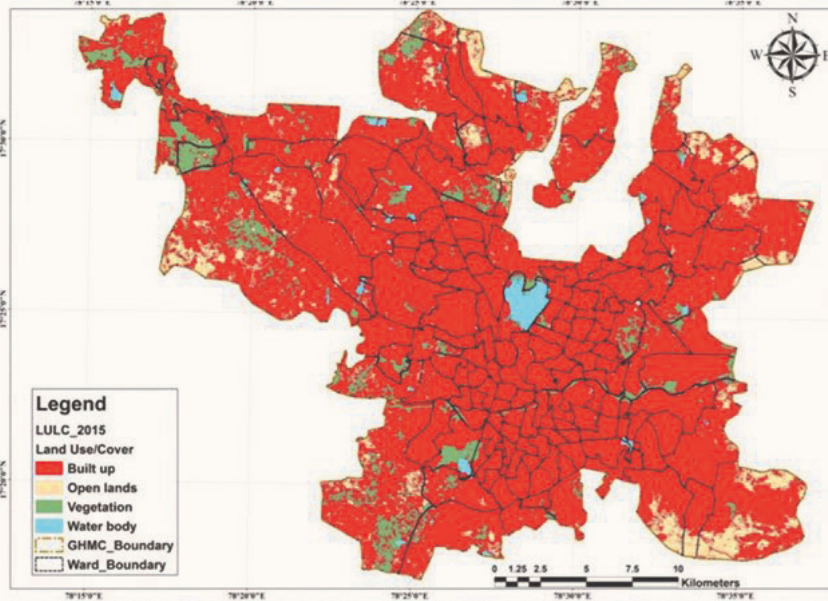
Hyderabad falls in a semi-arid climatic zone with a predominantly hot and dry climate, and average summer temperatures between 34-39 degrees Celsius. It receives 80 percent of its annual rainfall from the southwest monsoon with an annual average precipitation of 860 mm. It has experienced devastating floods in the past. The most disastrous was in 1908 when low-lying areas up to a height of 3.3 meters were inundated and the river Musi broke its banks, claiming nearly 15,000 lives and destroying over 19,000 homes. A flood management and drainage proposal for the city was made by Sir M Visvesvaraya leading to the construction of

two upstream storage reservoirs - Osman Sagar in 1920 and Himayat Sagar in 1927 (researchgate.net).

Though Hyderabad has not experienced such high intensity rainfall since, the twin reservoirs have saved Hyderabad from at least six major flooding events between 1908 and early 2000s. In August 2000, rainfall of 241.5mm a day inundated several areas under 2-4 meters of water. Eight years later, the city received yet another heavy rainfall of 137 mm a day inundating low-lying areas. The most recent flooding was in October 2020, which saw rainfall of 192 mm (The Hindu) affecting, over a few weeks, as many as 1,80,000 people and causing an estimated loss of Rs 5,000 crore (Deccan Herald).

It led to the inundation of several low-lying areas, breaching of lake bunds, collapse of buildings, and flooding of river causeways. The catastrophic flood of 1908 and subsequent modernisation of Hyderabad left a profound impression in the collective memory of the city. However, current heat waves and extreme rainfall events have a dispersed and insidious impact, treated as isolated incidents and individualised experiences. This leads to their absence from public discourse and makes it harder to grasp

Built-Up Area map of Hyderabad city in 2015



Source: International Journal of Engineering Research & Technology (IJERT)

Buildings, roads, and other infrastructure absorb & emit the sun's heat more than natural landscapes such as forests and water bodies. Hyderabad has become hotter in the last two decades, when compared to adjoining sub-urban and rural areas, due to fast-paced urbanisation.

the extent of their consequences. The city has witnessed temperature variations and successive hottest years, with the summer temperature reaching as high as 47.6 degrees Celsius in 2015, and 44.4 in 2020. This trend corresponds with the unprecedented increase in temperatures in India in recent years (nature.com). Climate models have confirmed that average, minimum and maximum temperatures are expected to rise in Telangana. Coupled with 40 percent humidity in summer months, the 40 degrees Celsius reaches a dangerous heat index of 48 degrees Celsius ('feels like temperature') causing severe heat stress for people.

The frequency and duration of severe heat waves increased significantly from the 1990s. The undivided state of Andhra Pradesh reported 3,054 deaths due to a heatwave in 2003 (researchgate.net). When a severe heatwave struck India in 2015, Telangana had the second highest death rate of 585 (Times of India).

The Urban Heat Island effect in Hyderabad exhibits significant variations with an annual

average increase of 1.25 degrees Celsius. This phenomenon occurs when urban areas have higher air and surface temperatures compared to their surroundings due to high-density built-up areas. There is a notable rise in minimum temperature and decrease in maximum temperature; this warming is high during night time. It disrupts the radiative cooling process, making night time conditions less comfortable and affecting people's health (tandfonline.com). The shifts in local weather patterns over the past two decades provide a clear indication of long-term trends in the city's climate, supported by scientific and archival data. These changes are considered among the 'climate signals' for Hyderabad that represent larger shifts attributed to Climate Change (researchgate.net).

*Cover photo by HMDA: Neopolis layout in Kokapet with Outer Ring Road (right) and Osman Sagar reservoir (left)*



*Photo: Arshiya Syed*

*View of the ongoing destruction of the Deccan landscape*



Scan the QR code to read  
the essay online.



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## **Rethink Guwahati's building bye-laws for net-zero carbon future**

As Assam's largest city Guwahati, urbanises rapidly, emissions have increased. Rising temperatures and extreme rainfall triggered by Climate Change have worsened the scenario, underscoring the need for energy-saving practices and making greener buildings. The approach to construction and the materials used are important in striving towards a net-zero goal. Also, the Energy Conservation Building Code has to inform all construction in the city. The idea of green buildings may have few takers but its elements and energy codes have to be written into Guwahati's building bye-laws to make the city climate-resilient for the future.

**Barasha Das and Harish Borah**  
QoC - CANSA Fellows  
Assam, India



Angshuman Kashyap lives in a three-storied residential building in Guwahati. The west-facing rooms of his apartment receive direct sunlight in the afternoon. “These rooms get much hotter compared to others and turn into furnaces when temperatures soar,” says Kashyap. The walls are brick and concrete, as is the norm. As evening descends, the heat can be felt radiating out of the westerly walls making even the air-conditioner, let alone ceiling fans, redundant. “This was built around 2004. We did not feel the need for an AC for many years but gradually installed. Now, even these are insufficient,” he says, adding that the glass facades of the building staircase heat the common space too.

Kashyap echoes what many lament about Guwahati’s high temperatures, unbearable heat, and rising power bills. The old Assam-type houses were more comfortable, they say. “They had high ceilings with ventilation, timber-framed walls plastered with a thin layer of cement, tin roofs, and concrete floors. The house kept cool. I regret demolishing my old house now,” laments Sujit Baruah. This is commonly heard in Guwahati.

It assumes serious connotations when seen with rising temperatures as Climate Change deepens its hold. Guwahati, the largest city in northeast India, experienced an unprecedented temperature rise lately. On June 7, the maximum temperature was 38.9 degrees Celsius – four-five degrees above normal and the second highest temperature ever recorded for June. On September 4, the city showed 38.2 degrees Celsius, the highest recorded for September in 72 years. Data from the India Meteorological Department (IMD) showed four other cities in Assam – Mohanbari in Dibrugarh, Tezpur, Jorhat, Silchar – experiencing a record rise in temperatures this day with Silchar registering its highest ever at 39.4 degrees Celsius.

As Climate Change-driven extreme weather shows up more, it has increased the demand for power in new buildings, which ironically, has led to a greater demand of electricity and higher emissions from fuel-burning. The global average is that cities are responsible for 70 percent of emissions (World Bank), and the construction industry is responsible for 37 percent (UNEP) of global emissions each year. However, 75 percent of them



Photo: Surajit Sharma

*A maze of electric poles and power lines is an integral part of Guwahati.*



*Fancy Bazaar area of Guwahati is cluttered with buildings*

emanate from the electricity produced from fossil fuels that is used daily in homes while the balance comes from manufacturing of construction materials. Cement and steel are among the largest carbon footprint among materials, globally (statista.com). Guwahati, with frenetic construction everywhere, is no exception.

### **Need for net-zero buildings**

Guwahati's readiness to reduce its emission footprint would have to cover its electricity grid, energy efficiency of its buildings, and the choice of materials used in its buildings. Its buildings and climate are inter-connected in more ways than acknowledged.

The city's Master Plan covering 328 square kilometres has 2,65,800 housing units for a population of nearly 11.4 lakh enumerated in the Census 2011, according to the Guwahati Metropolitan Development Authority (GMDA). It estimates that, by 2045, the population will rise to over 38.5 lakh, creating a demand for

at least 6,80,000 houses. The challenge is not only to build these houses but to build them green and climate-resilient.

"Guwahati and other cities in Assam are urbanising at a tremendous pace. We must prioritise to establish an ecosystem that pivots our building stock to a net-zero carbon future, by encouraging building energy efficiency and low-carbon-intensive construction materials," says Ragini Goswami, architect and specialist in green buildings. "If we miss regulating the current stock of buildings, we will most likely be locked into maintaining buildings that will be energy intensive and high carbon emitting."

A net-zero carbon building is designed to have a minimum emission footprint – both by minimising its electricity consumption and using materials that come from low-emission manufacturing processes. The design strategies involved are similar to the globally-recognised green buildings which minimise

electricity consumption and factor in sustainability aspects such as soil, water, and waste. The way to decarbonise Guwahati's buildings lies in reviewing and re-writing its building bye-laws.

**Interventions to decarbonise buildings**  
This becomes important as temperatures soar and the peak hour demand for electricity gallops. It touched 2,500 MW this year which was a substantial increase from 1,970 MW in 2022-23. This demand is projected to be 4000MW by 2026 (Economic Times). Only 25 percent of Assam's electricity demand comes from Renewable Energy (RE) while 75 percent of the grid is from fossil fuel sources; the figures for Guwahati are not available. The power that Assam purchases from other states is fossil fuel-based too. The state government has installed new solar plants with a capacity of 45 MW only, approximately 70 percent of which is in Guwahati.

Regulating buildings and construction to reduce Greenhouse Gas (GHG) emissions has been around since the early 1990s with the advent of Green Building Rating Systems (GBRS) and India actively adopted it in the early 2000s. International and indigenous organisations support the transition to green buildings and the GBRS offers strategies for decarbonising. "It has dedicated criteria for low-energy intensive construction materials and local materials. It makes a strong case for their use within the building design frameworks," explains Shabnam Bassi, deputy CEO of GRIHA Council, an organisation that promotes green buildings.

However, Guwahati (in fact, Assam itself) is out of sync with the green building movement. In these decades, only eight certificates have been issued to Assam while 503 were issued in Maharashtra, 238 in Tamil Nadu, 185 in Uttar Pradesh and 181 in Gujarat. Assam is lagging behind 20 states and Union Territories on GRIHA's Green Building certification. Just as crucial to decarbonising buildings is the inclusion of the Energy Conservation Building Code (ECBC) of 2007 or the ECBC-Residential (R) and Eco Niwas

Samhita of 2018, which Guwahati must introduce into its building bye-laws.

This framework – of GBRS and ECBC in the bye-laws – could achieve energy efficiency in buildings in line with the recommendations of the Bureau of Energy Efficiency (BEE) under the Energy Conservation Act of 2001. States are required to have frameworks to suit regional conditions and enforce them through the building bye-laws. The BEE's State Energy Efficiency Index 2021-22 shows that 30 out of the 37 Indian states and UTs are ahead of Assam. A dozen states have already adopted the ECBC in the building bye-laws of one or more of their cities while this integration is underway in 18 states. Assam cannot afford to be laggard.

### **Lacunae in existing bye-laws**

In Guwahati, citizens show ignorance about green building frameworks and the ECBC. Both Kashyap and Baruah said their architects had not mentioned such things. Along with revising the building bye-laws, Guwahati administration would also have to run awareness campaigns.

Chinmoy Phukan, architect and former Indian representative to Architects Regional Council Asia's Young Architects' Council, says that "The general public needs to be made aware of energy-saving practices and their benefits on both the environment and their wallets. Only then will green buildings flourish." Adds Saurav Pansari, managing director and CEO of Royal Aawas and co-chair of Indian Green Building Council (IGBC) Northeast Chapter, whose Royal Aawas Tezpur was rated platinum, "Most developers do not get the right consultant for guidance and certification though they have been adopting certain measures like heat reflective paint, plantation of trees, use of UV reflective glasses, terrace gardening, cross ventilation, so on."

The green building ecosystem calls for many stakeholders – government, architects, financial institutions, and people. "There is a

lack of consultants and professionals in the northeast region and a dearth of awareness among people on the subject,” adds Pansari. The city has had the Guwahati Building Construction (Regulation) Bye-laws 2014 which were amended in 2020. Last October, the state government notified the Assam Unified Building Construction (Regulation) Bye-laws 2022 which apply to Guwahati. Both the bye-laws lay down the following: minimum 20 percent solar energy in the building’s connected load, optimising building design to reduce the demand for conventional energy, and use of less energy-intensive materials or regionally available materials. In fact, they also have appendices to green building certification and provide property tax rebate for buildings which qualify for Green Star ratings. Yet, the movement towards certified green buildings has been slow.

The shortfall in the bye-laws is that they offer no clarity on the processes between real estate developers and the state authorities, and do not clearly mention the rebate in property tax. “The government should encourage builders to acquire the

certification with other incentives because property tax rebates have not generated interest, especially in the residential sector,” says Pansari, “Expecting developers to deliver green buildings with no real support from the government, in a home-buyers’ market which lacks demand for such buildings, is not the best strategy.”

However, the major lacuna is that five to six years after the ECBC codes were introduced, they are yet to reflect in the building bye-laws. The state missed this crucial integration even during the amendments in 2020 and in the Assam Unified Building Construction (Regulation) Bye-laws of 2022. This is despite the presence of the Assam State Designated Agency (ASDA) since 2002 to coordinate, regulate, and enforce provisions of the Energy Conservation Act, 2001.

Angana Das, former project officer of the ECBC Cell for Assam, explains, “The Inspectorate of Electricity, under the power department has the additional responsibilities of the ASDA. During my time, I saw how occupied they would be with the Inspectorate’s work alone. The additional



Photo: Surajit Sharma

A multi-storey building in Guwahati is dotted with air conditioner units.



*Guwahati has seen a surge in construction activities in the past few years.*

responsibilities add a significant workload, also frequent transfers lead to repetitive briefing and acquainting the new officials with the work. It was natural for the workflow to slow down.”

### **The way ahead**

Since the incentive of property tax rebate has not yielded results, the building bye-laws could explore others such as Premium Green Building FAR (Floor Area Ratio) which has shown results in states like Maharashtra, Uttar Pradesh, West Bengal, and Tamil Nadu ([igbc.in](http://igbc.in)) where developers are incentivised with extra floor space to ensure a certified green building.

While the extra floor space may add to the increased pressure on the state’s energy and material demand, it can be managed by providing differential FAR incentives based on the building’s certification level. For example, a 5-star green building can be provided with a higher percentage of FAR incentive compared to a 3-star one. This would ensure that the improvement in energy and material efficiency of the building stock is always

greater than the rise in energy demand due to the FAR increase. The state treasury can benefit too in the form of extra fees for the premium FAR.

Further, the state can go beyond the minimum provisions set out in the Energy Conservation Act, 2001, and dedicate a stand-alone team in collaboration with the BEE which will understand the state’s contextual protocols and deliver on the energy conservation codes. Incorporating the ECBC and ECBC-R into the building bye-laws would mean a mandate to all to follow them. This is why revising building bye-laws is crucial.

Hrishiraj Sharma, assistant director, Town and Country Planning in Assam says, “Encouraging green building practices is of utmost importance as Assam sees the adverse effects of Climate Change such as increased temperatures and erratic rainfall. The techniques can significantly contribute to mitigating these impacts and enhancing resilience. Secondly, the state’s abundant natural resources, including bamboo and locally sourced materials, could be used which align perfectly with

the green building principles. These not only minimise the environmental footprint but also support local economies and traditional craftsmanship.”

Adopting the green building approach could also lead to substantial long-term cost savings for residents and businesses through reduced energy and water consumption too. This, in fact, can attract investment and tourism thereby bolstering the local economy. “By fostering awareness and adoption of these norms, Assam can set an example for other regions facing similar environmental challenges, promoting a more sustainable and eco-friendly future,” he explains. Officials say that the application of the ECBC is in progress, though in an ad-hoc manner.

The green building rating agencies do not have permanently stationed teams in Assam; they withdrew when there was no demand for the certification. With growing urbanisation, the time is apt for the agencies to return to the state and support the building sector’s transition to energy efficiency.

### **Net-zero carbon building future**

At this juncture, it is only fitting that every institution, whether private or government and every individual, accepts that they are contributing factors to Climate Change and play their part to mitigate it. Decarbonisation of buildings has a large role to play in this, for which re-thinking how the ECBC, green building and net-zero design frameworks are integrated into the building bye-laws is

important. This could mean a sustainable or turbulent future.

“It is frustrating to see that green building protocols are still neglected across the region. Besides ensuring efficient use of resources including energy, water, and waste, they are designed to improve the quality of life by improving indoor and outdoor air. The implementation of even the existing guidelines could significantly bring down carbon emissions, this should be prioritised,” says Rituraj Phukan, international climate activist from Assam.

Lubaina Rangwala, associate director of the World Research Institute who worked closely with Brihanmumbai Municipal Corporation to develop the Mumbai Climate Action Plan, adds, “The success of a climate action plan hinges on genuine collaboration between all state government departments with a common goal to cut back on GHG emissions while proactively safeguarding the future of the city communities, especially those most vulnerable to Climate Change. The ‘interdepartmental collaboration’ makes all the difference.” The Mumbai Climate Action Plan is a 30-year roadmap and systematic framework for climate resilience with mitigation and adaptation strategies through low-carbon, resilient, and inclusive development pathways.

Guwahati, and for that matter Assam, must adopt the green buildings framework in sustainable ways to eventually become a net-zero carbon city and state.

*Cover photo by Surajit Sharma: View of Guwahati city*



Photo: APDCL

*Workers install solar panels at a plant in Assam.*



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the essay online.



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## Delhi's heatwave, floods, and G20 beautification force urban poor to pay heavy price

In the sweltering heat of the Indian capital, the lives of the urban poor have been turned upside down by the ruthless demolitions carried out for Delhi's G20 beautification drive and subsequent floods. Forced out of their homes and left without shelter amidst scorching temperatures and heavy rainfall, they grapple with uncertainty and despair. As the climate crisis intensifies, the lack of infrastructure, gaps in communication and support from authorities further exacerbate their vulnerability to heat-related dangers. The national capital does not have a functional Heat Action Plan, aggravating the problems arising out of extreme weather events. It's time authorities in Delhi act and chalk out a plan to deal with the effects of Climate Change.

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Sultana Bano, in her late 40s, did not have a choice back in May, when demolition squads razed her *jhuggi*. An Aganwadi worker, she lived with her husband, a paralytic, in a cluster of slums in the Tughlakabad area in the southeast of India's national capital, New Delhi, and had bought an air cooler from her meagre monthly earning of Rs 7,000-8,000 to make the city's infamous heat slightly bearable. When the demolition squad came to raze the cluster, all 3,000 houses in it, Sultana knew she had to forego the cooler that had cost her a month's pay. "I could only save my husband. Life is more important," she said.

Bella Estate area, in Old Delhi and to the east of the Yamuna river bank, is a quaint neighbourhood with narrow alleys and old houses. Residents of Bela Goan are mostly old-timers like Rekha's family of five, with homes that hold memories. In her late thirties, Rekha lived in Moolchand Basti in Bela Gaon. In March this year, Rekha with other residents watched as the demolition squad ripped through the makeshift homes of the Basti and ran the bulldozer over their fields too. When Rekha, heart pounding, demanded to see documents, the Delhi Development Authority (DDA) officials showed her a notice which stated that the area was a part of the 'beautification drive' for the upcoming G20 Summit. Unconvinced, she asked them to prove their modest homes were illegal; the officials laughed, she remembers. "Are we collateral damage for this beautification," she asked, shuddering at the memory of how her home was reduced to rubble.

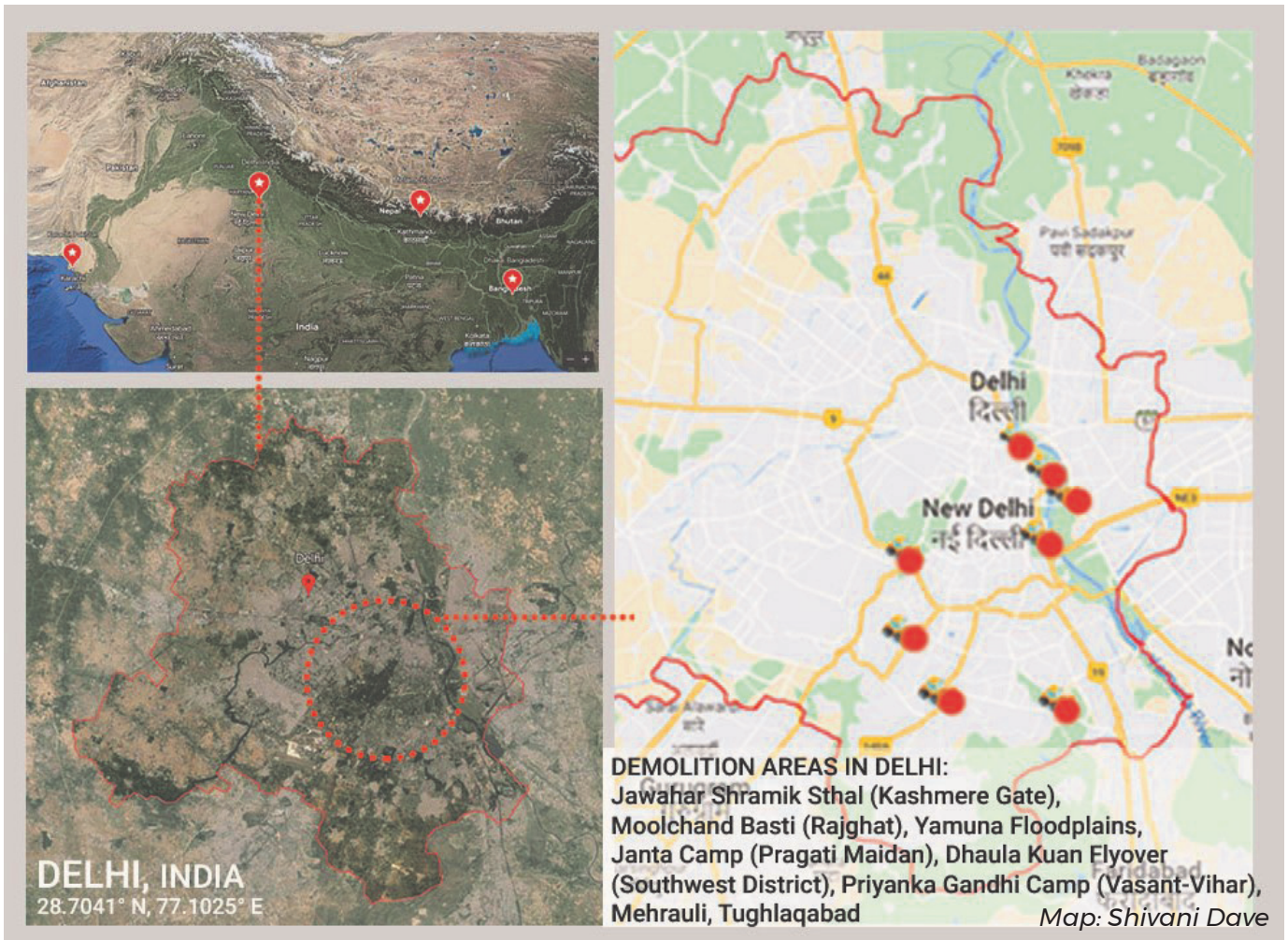
About 10 kilometres away, Hiralal Jha, 25-year-old resident of the Yamuna Pushta area, was in a worse predicament on June 21. Physically challenged, Jha depended on his neighbours to negotiate life. That morning, he woke up to the sounds of destruction; the demolition squad of the Municipal Corporation of Delhi was on a determined attack against some 350 *jhuggi-jhopris* and

showed mercy to none. His was gone too. "I had begged on the streets to build this house of tarp and wire," he wailed.

Over four months from March to June of this year, as intense heatwaves seared Delhi followed by devastating floods, five working-class neighbourhoods – all predominantly slum areas – lakhs lived through the worst possible nightmare of losing their homes. The Municipal Corporation of Delhi, run by the Aam Aadmi Party (AAP), and India's national government, led by the Bharatiya Janata Party (BJP), began the "beautification" plan for Delhi to get it spiffy and show-worthy in time for the G20 Summit to be held on September 9 and 10. India has the Presidency of G20 this time (CNBC-Tv 18).

The 'beautification' was a cruel joke on the city's worst-off for whom it meant losing their homes, however ramshackle; the demolitions left nearly 2,60,000 people homeless. Without a clue of what G20 means except that it is some big event for the country or the Prime Minister (seen on hoardings), they were out in the open in appalling levels of heat and floods. The national capital which should have seen climate resilience plans in action during extreme weather events such as these, to provide relief especially to the poor and marginalised in the city, was throwing them to the harsh elements, literally and figuratively.

The G20 is intended to showcase a positive image of the country – and Delhi as its national capital – on the global stage. The price for this has been, and is being, paid by those most vulnerable to extreme weather events and Climate Change impact. Ironically, 23 hotels are being spruced up to house delegates and dignitaries for the G20 Summit. As the demolitions have shown, the government's pronouncements and claims of climate resilience made on global platforms are hollow. Similarly, climate vulnerability has hardly made its way into urban policy and governance; if it had, thousands would not be dishoused across Delhi.



This map shows all the areas where demolitions have taken place in Delhi.

### Demolition as a response

This spate of demolitions has been linked to the G20 beautification drive but Delhi has seen demolitions as a routine administrative approach. Termed ‘encroachments’, the *jhuggi-jhopdis* and slum clusters are easy targets. Between February and July last year, Delhi witnessed several demolitions by the central government: Indian Railways razed 250 homes in Punjabi Bagh without a resettlement plan, evictions happened in Gyaspur where the DDA demolished 100 homes, to cite only two. The High Court, seized of the issue through a writ petition (9625/2022) did not intervene, citing the non-inclusion of these in the Delhi Urban Shelter Improvement Board’s list of *bastis*.

“Whether for G-20 or not, forced evictions invite gentrification through privatisation and development-induced displacement,” said Rajendra Ravi of People’s Resource Centre. He pointed out in his report that “As is seen

in the case of infrastructure and ostensible ‘development’ projects, including road/ highway expansion, canal widening, and metro projects, over 77,000 people in 2017 were displaced.”

Other reports highlighted unseen aspects of these demolitions. The Housing and Land Rights Network’s report showed that Muslim slum homes were demolished after communal clashes, such as at Mansarovar Park in May last year, suddenly terming them ‘encroachments’ (hlnr.org). In 2021, it recorded 158 forced eviction incidents across the country averaging 100 homes a day. A report by urban scholar Gautam Bhan, of the Indian Institute for Human Settlements, noted that between 1990 and 2003, a total of 51,461 houses were demolished in Delhi under ‘slum clearance’ measures, and between 2004 and 2007, around 45,000 homes were demolished (Sage Publications). However, less than 25 percent of them were resettled.

Under the Indian Presidency, the G20 Summit is focused on the theme 'One Earth, One Family, One Future' to affirm the value of humans, animals, plants, and microorganisms and their interconnectedness on earth and in the broader universe. The Ministry of Earth Sciences is popularising Lifestyle for Environment (LiFE) with an emphasis on environmentally sustainable and responsible choices that people should make for a cleaner, greener, and bluer future (moes.gov.in). During the G20, Working Groups are scheduled to address areas such as green development, climate finance, inclusive growth among others.

Despite tall talk, demolitions were undertaken further intensifying spatial and other inequalities. "What kind of climate justice calls for demolitions of houses? Who bears the brunt of carbon emissions by the super-rich and the West?" asked Anirban Bhattacharya from the Centre for Financial Accountability. However, the DDA denied demolitions for beautifying the city for the G20 summit (NDTV). In a written reply to Rashtriya Janata Dal (RJD) Rajya Sabha MP Manoj Kumar Jha, junior minister for housing Kaushal Kishore said that the DDA had informed him this. Facts on the ground belie this assertion.



Photo: Sejal Patel

*At least 10 rebuilt jhuggis sank deep in water, due to which the danger of snakes and other venomous creatures is ever present.*

Relative Humidity %	Temperature °C																
	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
40	27	28	29	30	31	32	34	35	37	39	41	43	46	48	51	54	57
45	27	28	29	30	32	33	35	37	39	41	43	46	49	51	54	57	60
50	27	28	30	31	33	35	36	38	41	43	46	49	52	55	58	61	64
55	28	29	30	32	34	36	38	40	43	46	48	52	54	58	61	64	67
60	28	29	31	33	35	37	40	42	45	48	51	53	56	59	62	65	68
65	28	30	32	34	36	39	41	44	48	51	53	56	59	62	65	68	71
70	29	31	33	35	38	40	43	47	50	53	56	59	62	65	68	71	74
75	29	31	34	36	39	42	46	49	53	56	59	62	65	68	71	74	77
80	30	32	35	38	41	44	48	52	56	59	62	65	68	71	74	77	80
85	30	33	36	39	43	47	51	55	59	62	65	68	71	74	77	80	83
90	31	34	37	41	45	49	53	57	61	64	67	70	73	76	79	82	85
95	31	35	38	42	47	51	55	59	63	66	69	72	75	78	81	84	87
100	32	36	40	44	49	53	57	61	65	68	71	74	77	80	83	86	89

Caution Extreme Caution Danger Extreme Danger

Source: Calculated °F to °C from NOAA's National Weather Service

**Recorded Delhi Temperatures: 40.1c (2018), 48c (2019), 46.8c (2020), 45.6c (2021), 49.2c (2022)**

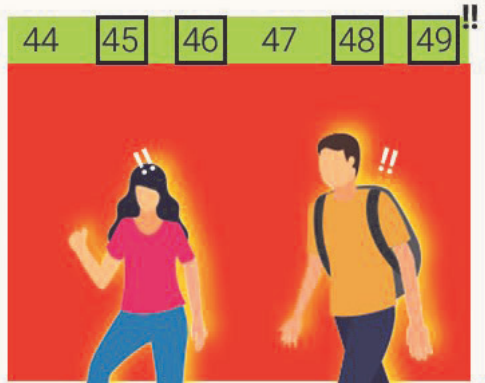


Illustration: Shivani Dave

Delhi has been seeing an increase in its summer temperature every year.

**Heatwave hazards and floods a double whammy**

Climate events such as intense heatwaves and floods that have racked Delhi in the past few months only worsen the condition of the poor and marginalised in the city. Reports such as the McKinsey and Company one on climate risk and response in South Asia found that India was at the top of the group of "critical" nations which included China, Indonesia and Pakistan for heat-related threats to their populations (mckinsey.com). Heatwaves have far-reaching impacts on, among other aspects, food security, and household incomes.

Delhi, a landlocked city, has always had harsh summers. For the past few years, Delhi and the National Capital Region (NCR) have seen temperatures consistently breach 45 degrees Celsius in summer months. The year 2019 saw a maximum temperature of 48 degrees Celsius; the following year, it touched 46.8 degrees Celsius, and in 2021, the highest was 45.6 degrees Celsius. Last year registered a scorching highest temperature of 49.2 degrees Celsius. Temperatures touched 46 degrees Celsius (113 Fahrenheit) this year in May. Combined with relative humidity and other factors, the Heat Index - or the temperature that people feel like - would have been in the 50s.

Such high temperatures would have called for measures under a Heat Action Plan (HAP) but Delhi does not have a functional one for the current year because it is awaiting approval from governments. Even cities which have formulated HAPs struggle to translate the protocol steps on ground during high heat days but the absence of a HAP means that authorities may not even be tuned to provide relief measures given that heat is a silent hazard. The absence of HAP also leads to non-provision of specific infrastructure such as shelters, cooling spots, regular water supply, and outreach clinics to reduce the impact.

While Mohalla Clinics provided some health-related support, this team did not find any other measure in place during the high heat days "There is no communication between the government and urban poor on the risks of heatwaves. Heatwave precaution guidelines are available on government websites and social media, but do not reach people who cannot access these though they are most vulnerable," pointed out Akshit Sangomla, a writer on environmental issues.

Floods mean the same set of challenges for the poor. Through July, Delhi was grappling with one of the worst floods in 45 years as the Yamuna breached its danger mark. Several people living in the low-lying areas had to be evacuated and housed in shelters. Those

in *bastis* struggled to simply stay alive; those whose homes had been demolished were literally at the mercy of nature.

Kalpana Devi, in her 30s, stands straddling her one-year-old daughter outside the makeshift shelter on the footpath leading to Shastri Park Metro station. The baby suffered from heat rash. When the Yamuna flooded on July 13, Kalpana Devi and many like her from Yamuna Khadar were not warned about the rising water levels. “My husband had gone out for work. I somehow took the kids, some home essentials, and made my way through waist-deep water,” she said. When the flood washed away her *jhuggi*, she lost even personal documents without which she cannot avail government’s flood relief.

Like other families, she too was not allotted temporary shelter by the district collector office; instead, they were all provided with a few tarpaulin sheets and foodgrains by an NGO. Prem, who lived in the same locality and earns Rs 250-300 a day as a daily wage labourer, ended up spending Rs 1,500 on a pathology test at a private lab. Ishrat, a teenager displaced by the floods, saw her *jhuggi* demolished in Yamuna Khadar in March during the ‘beautification’ (demolition) drive. She somehow managed to rebuild her hut but it got washed away in the floods.

Similar stories abound here. Most families are migrants from remote areas of Bihar and Uttar Pradesh, setting up ‘homes’ in the neglected subserviced parts of the city, vulnerable to demolitions as well as floods.



Photo: Hrushikesh Patil

*Rekha looking at the ruins of her house in Moolchand Basti of Bella Estate gaon.*

### **Known housing problems, ignored solutions**

The Delhi government’s department of environment, in charge of preparing the State Action Plan for Climate Change assessed that the south and northeast parts of Delhi are most vulnerable to Climate Change impact though research at Cambridge and

Yale University showed that all of Delhi is at dangerous Heat Index levels ([journals.plos.org](http://journals.plos.org)). Another study referred to the Delhi SAPCC 2022 but the plan itself is currently not available on the website of the Delhi government ([delhigovt.nic.in](http://delhigovt.nic.in)).

Besides this, the district-level Heat Index research shows that even low climate-vulnerable areas of Delhi are at high heatwave risk. The SAPCC 2017, used currently, does not factor in the Heat Index; without this, relief measures and warning systems cannot effectively plan for the full impact of a heat wave, especially on the urban poor. Their vulnerability increases manifold when they are left without a roof over their heads after demolitions. India makes an assessment of climate vulnerability – there is a national Climate Vulnerability Index ([dst.gov.in](http://dst.gov.in)) - but it does not consider factors such as affordable housing for urban poor to map heat-induced vulnerabilities.

Without structural solutions in the housing sector, which makes affordable housing a priority, reducing climate vulnerability of the urban poor is a mirage. According to the Economic Survey of Delhi 2022-2023, “about one-third of Delhi lives in substandard housing, which includes 675 slum and JJ Clusters, 1797 unauthorised colonies, old dilapidated areas and 362 villages. These areas often lack safe, adequate housing and basic services. According to the projections, Delhi needs 24 lakh new housing units...of these, 54 percent are required for the EWS and LIC.” ([delhiplanning.delhi.gov.in](http://delhiplanning.delhi.gov.in))

The numbers are staggering. The *jhuggi*, *basti* and slum clusters are home to 1.7 million people, often called ‘encroachers’, the unauthorised resettlement colonies house nearly four million, and the notified slum areas or *katras* have nearly two million people living in them, thousands of them with a ‘perpetual licence’ providing a fragile shield against demolition. Besides, there are 135 urban villages and nearly twice that number awaiting a formal transition from rural, and there are around 16,000 homeless and pavement dwellers entirely at the mercy of governments.

It is a complex landscape of people and housing, especially at the lower end of income – at once a complex story of urban growth including the provision of affordable housing (or the lack of it) and multiple stories of some of the poorest urban families dishoused and dispossessed for lofty city beautification programmes. There is a human cost of such ‘beautification’ – for G20 Summit or any other purpose – and it is paid by those who can least afford to, who anyway have very little space to call their own.

There will be discussions and mentions of Climate Change during the G20 and later at Conference of Parties COP28, there will be the usual talk of making India climate resilient and reaching the most vulnerable and so on, ‘climate targets’ will be set and carbon set-offs decided. All of this sounds hollow and meaningless to the lakhs whose homes were razed, homes they had ‘built’ where they could because affordable housing and climate-resilient housing are beyond their mindscape. Without adequate housing and other basic services, climate resilience and targets are just hot air – all talk, no action.

Climate Change stamped its presence all over Delhi twice this year – in unprecedented heat and record-breaking floods, hitting and displacing the poorest some of whom also bore the brunt of demolitions. Climate justice must mean rehousing and rehabilitating them as well as providing adequate affordable housing for all.

*Cover photo by Sejal Patel: Demolition drive led by DDA razed tubewells built by Bella Estate Residents*



*Photo: Sejal Patel*

*A woman of Bella Estate guarding the remains of her jhuggi after a snake passed by.*



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## **Nepal's Melamchi, still recovering from 2021 flood, shows multiple risks of rapid urbanisation**

Melamchi, 76 kilometres from Nepal's capital Kathmandu, was bouncing back from the massive 2015 earthquake when the flood in 2021 brought further devastation. The ravaging flood also severely damaged its ambitious water supply project which had taken nearly three decades to be operational. Climate Change made its presence felt as many lives were lost, and houses and infrastructure severely compromised. An unnatural temperature rise leading to rapid snow melting in the mountains led to the flood. Even as the small town grapples with extreme weather, the need for a concrete Climate Action plan is more urgent than ever.

**Kushal Pokharel and Chhatra Karki**  
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**Melamchi, Nepal**

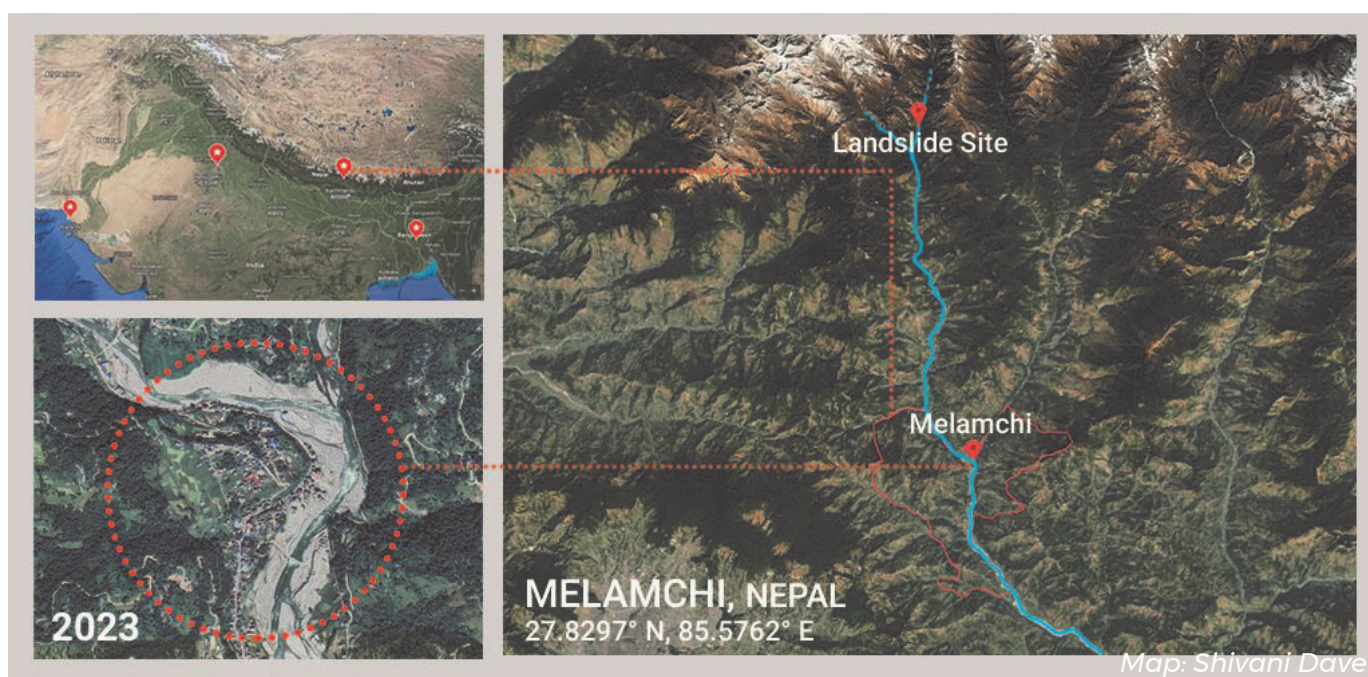


Lalit Dulal, 25, remembers that catastrophic day as if it was yesterday. He was in Melamchi Bazaar when he came upon the devastating flood sweeping away stones, logs, and cowsheds on June 15 two years ago as the Himalayan glaciers melted and brought down a torrent. “We got to know that the Melamchi River had flooded. My family and I moved to a safer place. The incessant rain showed no sign of stopping; the entire Melamchi Bazaar was destroyed,” recalled Dulal.

His house was far from the river, so it was not washed away. “However, my maize and vegetable crops cultivated on roughly 0.126 acres were destroyed. Even the tractor used for farming was submerged,” he recalled. Rudra Kumari Shrestha, 30, was less fortunate; she helplessly watched her house on the top floor in Rudreshwar Higher Secondary School’s compound collapse. “Floor by floor, the entire house sank; all my property was gone in a few minutes,” she cried. Melamchi has not been the same again though life is slowly trickling back to pre-flood normalcy.

The unprecedented flood in the Melamchi River, 41-kilometres long which originates in the Jugul Himal range and joins the Indrawati River at Melamchi Pul Bazaar, severely damaged its ambitious water supply project. Counted among the national pride projects (npc.gov.np) and built with international funding to supply 170 million litres a day to Kathmandu, it had been nearly three decades in the making but operational for only a year. It had not budgeted for Climate Change impact.

Located around 76 kilometres from Kathmandu, the capital of Nepal, Melamchi in Sindhupalchok district was a small town in the 1990s when the project took off the ground. Now, Melamchi faces multiple hydro-meteorological hazards and the inevitable impact of rapid urbanisation which precipitated environmental degradation. The risks are now extending to the upper reaches of the Melamchi River, jeopardising water supply to Kathmandu especially during heavy rainfall and floods.



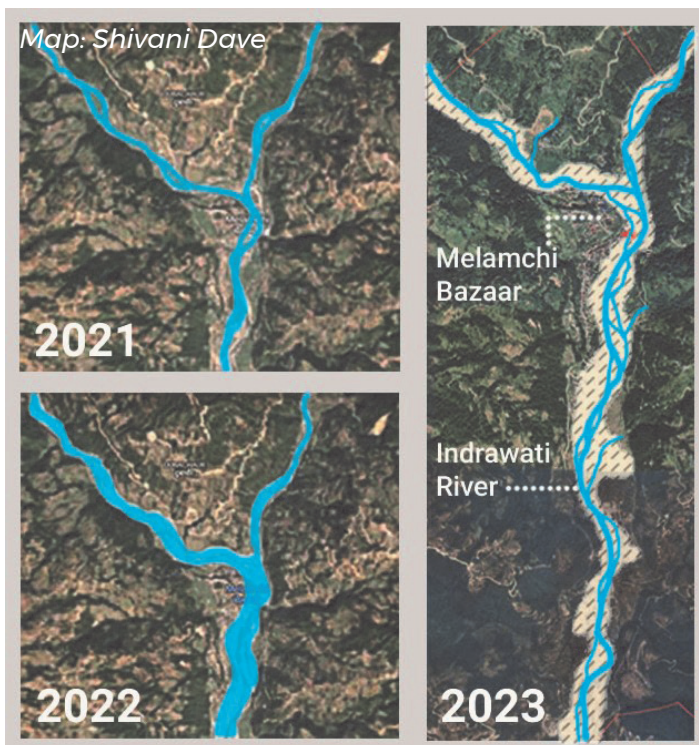
The map on the right shows the area of the landslide which led to flooding in Melamchi.

## Growth marred by disasters

The history of Melamchi dates back centuries to the Rana dynasty. The town was on the Kathmandu-Tibet route, and remained quiet and quaint for years. As the Melamchi Water Supply Project (MWSP) gained ground and work opportunities opened, people began settling here. Schools, hospitals and other infrastructure expanded. Soon, Melamchi had turned into a centre of attraction in the district, and Melamchi Bazaar became a thriving business hub with hotels, lodges and handicraft businesses catering to tourists passing through the town.

The town comprises Mongolians, Aryans and other ethnic groups living across its 13 wards. The major source of livelihood is agriculture and animal husbandry and dairy business; its growing economy has focused on commercial farming by setting up pocket areas. Besides agriculture, Melamchi's recent prosperity has been driven by tourism (tourists heading to Gosaikunda, Helambu, Panchpokhari), industry and watershed (melamchimun.gov.np). However, "the devastating earthquake of 2015 brought Melamchi to a complete standstill. As it was slowly bouncing back, the unprecedented flood in 2021 pushed Melamchi into further misery," said Dharmakrishna Shrestha, a septuagenarian businessman here.

The Melamchi Municipality took its present shape in 2017 when four neighbouring village development committees (VDCs) of Bhotechaur, Haibung, Thakani, Dubachaur and a part of the Shivapuri National Park were incorporated. The Municipality witnessed rapid population growth since 2011, at 5.2 percent per annum (melamchimun.gov.np). Melamchi Bazaar became the business and service hub. Its fortunes saw a dramatic turnaround with the June 2021 flood as many lives were lost and massive damage to infrastructure ensued. Minesh Gurung, project officer at Practical Action Nepal working in Disaster Risk Reduction field, noted that Melamchi has always been at risk of multiple disasters



Comparative images highlighting the river before and after it flooded.

including earthquakes, floods, landslides, fires, lightning, and glacier melting and glacial lake burst.

The conversion of vast areas of farm land (into housing plots, driven by rapid urbanisation, has been increasing in Melamchi. The trend of land transactions has increased land subdivisions and sprawl. Thirty-seven percent of the municipality was forested (gggi.org) in 2017; it would have declined. To add to this, haphazard construction of roads and the expansion of settlements has put a strain on the natural environment. In recent years the number and scale of operation of stone crushers and sand mining has increased dramatically along the Indrawati River (Kathmandu Post).

## Horrendous floods, sign of future

The Melamchi River watershed receives more than 1,200 mm of rainfall during the monsoon every year. Extreme precipitation events and associated hazards continue to occur; these are compounded by Climate Change as witnessed during June and July 2021 when it not only rained massively but flood water engulfed parts of the town. The flash flood on June 15 followed by a recurring



Photo: Dipen Dhungana

*Haphazard constructions in Melamchi have put a strain on the natural environment.*

flood the following month devastated 255 households, two concrete bridges, two suspended bridges and thousands of hectares of agricultural land, bringing the entire town to a dead halt for several weeks. Large parts of Melamchi were covered in rubble and thick mud, thousands of trucks were needed to clear it.

Researchers are still investigating the causes of the devastating flood and the contribution of different factors but most research offers the view that the massive disaster was the result of a series of compounding events. A study by ICIMOD in 2021 on the Melamchi Flood Disaster attributes its cause to multiple processes along the Melamchi River including massive 21 million metric tonnes of debris dumped in the upper part of the Melamchi River; of this, four million metric tonnes trickled down during the flood which means that the remaining is lodged in the upper part of the mountain region around Bhemathang. Therefore, the danger is not

over yet. The ICIMOD study too says so.

Ranjan Kumar Dahal, a leading geologist and climate researcher who studies Melamchi area, confirmed that around 15-metre-high debris has piled up at the Melamchi Water Supply Project site and the clean-up work could cost Rs 300-350 million [about £1.8 million USD?]. “The floods damaged the roads and bridges to the project site and washed away the campsite and construction materials,” said Dahal.

Some studies have indicated the overflow of the Pemdan glacial lake located upstream in Melamchi catchment which resulted in the destruction of the natural dam of the Bhemathang area, ultimately eroding the riverbed. The origin of this disaster can be traced to, among other factors, the 2015 earthquake which triggered multiple landslides in the Melamchi River catchment increasing its susceptibility to slope instability. Another noticeable factor,

linked to Climate Change was the perceptible rise of five to nine degrees Celsius rise in temperature that month which melted the glaciers and cascaded unimaginable torrents into Melamchi area (The Himalayan Times).

Climate Change impact is written all over the calamity. Ichharam Sapkota, disaster risk reduction in-charge for Melamchi-based Community Development and Environment Protection Forum, attributes the flooding to unusual and sudden heavy rainfall in the mountains possibly triggered by Climate Change. "The impact of Climate Change is increasingly being felt across Sindhupalchok district with an unnatural temperature rise leading to rapid snow melting in the mountains. Heavy rainfall in high Himalayan regions has resulted in this flood," explained Sapkota.

### **More responses needed**

Climate Change impact was likely exacerbated by human interventions and urbanisation decisions. There was record-breaking pre-monsoon rainfall including in the usually arid regions which should have alerted authorities. Experts said that 60 percent of the rainfall occurred in only two weeks (The Third Pole). The day that Melamchi River burst was also when Chame, a district capital city, was massively flooded.

Human factors cannot be ignored too. The negligence of locals in adhering to construction guidelines played its part. Amrit Kumar Dhital, chief administrative officer of Melamchi Municipality, explained that "the UNDP report classified areas around the Melamchi River into high-risk red zone, low-risk yellow zone, and non-risk green zone categories. The flood washed away the red zone area resulting in damage amounting to 500 million US dollars."

The mushrooming urban settlements with massive construction in the high-risk areas of Talamarang, Thulokhet and Melamchi Bazaar should have been strictly prohibited but the municipality failed to stop rapid

and thoughtless urbanisation. People paid a heavy price for this: Municipality requested residents to comply with the rule but did not take strong action against violators.

Asha Khanal Shrestha, a 42-year-old hotelier, and her family lost her Melamchi Cafe Inn in the Bazaar as well as her agricultural farm nearby. "Our family has been living in Melamchi for three generations. We had never imagined that a flood of this intensity would ever occur," said Shrestha, adding that the family had invested Nepal Rs 16 crore to build the hotel and paid 4.5 lakh in taxes to the Municipality - it went in a flash. "My husband cleaned the sediments and removed the water. Our request to the municipal authorities for an excavator was in vain...we still fear massive floods every monsoon," she said.

Besides the municipal apathy, there was another disturbing aspect - the lack of disaster risk assessment and quick emergency response mechanism even in the high-risk areas. The Municipality, however, disagreed. Dhital argued that "the Municipality was constantly in action... We waived off charges for three months for people in rented houses, provided basic food for six months to all the affected." However, people were "unwilling to migrate to safer places because they consider leaving their ancestral land a bad omen." The key here - and Dhital agreed - is that the existing policies provide compensation only for people who lost houses but not their land or other property.

This highlights once again that Nepal has work to do on the disaster response and rehabilitation mechanism. Importantly, how and to what extent Melamchi - and similarly ecological-fragile places - can be urbanised should have become a focal point of debate. It is important to empower the local government with more human and financial resources and institutional capacities for effective disaster management instead of top-down strategies to combat such disasters.

# NEPAL

## MELAMCHI MUNICIPALITY, BAGMATI PROVINCE

IMAGERY ANALYSIS: 24 JUN 2021 PUBLISHED 5 JUL 2021 V1

ANALYZED AREA  
13km<sup>2</sup>

POTENTIALLY AFFECTED STRUCTURES  
150



FLOOD  
FL20210630NPL



### Landslides impact analysis in Melamchi municipality, Bagmati province, Nepal as of 24 June 2021

This map illustrates satellite-detected flash floods and landslides in Melamchi village, Melamchi municipality, Bagmati province, Nepal as observed using a Sentinel-2 satellite imagery acquired on 24 June 2021. Within the analyzed area, approximately 150 structures appear to be potentially affected by the landslides.

This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to United Nations Satellite Centre (UNOSAT).

#### Legend

- Village
- Potentially affected structure
- 🚧 Potentially affected bridge
- Road
- ⬜ Analysis extent
- 🟠 Landslide extent (24 Jun 21)



Since that devastating flood, Melamchi has continued to face calamities. This August too, heavy floods disrupted road networks and caused agricultural damage showing that the 2021 – though massive – was not an exception. Melamchi is situated on one of the most geologically fragile areas of Nepal and carries great risks of earthquakes, landslides, and floods; this should have led the Municipality to devise short-term strategies along with comprehensive plans to address the crisis, and paid close attention to the urbanisation model adopted.

There are issues which transcend economic and infrastructure damage in a flood, such as people’s mental health. After June 2021, Melamchi witnessed a surge in suicide cases and people suffering from anxiety and depression. “Women, children and senior citizens have been severely affected. Children couldn’t attend school, women lost their land and had restricted mobility,” pointed out Asmita Aryal, officer of the judicial committee of Melamchi Municipality. In fact, deputy mayor Uma Pradhan called for analysing the

disaster from a gender perspective, noting that during the 2015 earthquake as well as 2021 floods, women, children, and the elderly were disproportionately affected. “Men often leave villages for work, women bear all the responsibility,” she said.

A two-day psycho-social counselling session had been organised then but more needs to be done, she agreed. The Municipality had collected data to identify trauma-affected people and found that they had low self-esteem along with apprehensions or fear of “something wrong” happening. It also developed a communication strategy that involved regular door-to-door interaction with the women, children and elderly people, recreational activities like music and culture programmes including sessions on motivation and positivity.

Disaster governance and road ahead  
Urban governance during such disasters has its roots in the provisions of the new Constitution of Nepal, 2015, which assigns disaster management to the concurrent right



Photo: Dipen Dhungana

The 41-km-long Melamchi River originates in the Jugul Himal range.

of federal, provincial and local governments. In cities, it would be the urban municipalities, with autonomous governing status, that are entrusted with the responsibility. However, there is scope for confusion and crossed wires – while local governments have the authority to deal with the Climate Change impact, disaster management is a shared responsibility. This has resulted in a muddle about policies, planning guidelines, and regulatory frameworks.

However, Melamchi Municipality was influenced by the June 2021 floods to form a team of scientists to assess disaster risks and propose short-term, medium-term, and long-term measures to mitigate future disasters. Towards this, the Municipality instituted building standards for settlements around Indrawati and Melamchi rivers, and identified alternative sites such as Bhattar in Talamarang, Tar in Melamchi and Paglipati to relocate settlements in the high-risk areas but has been unable to implement it.

Besides, it has installed three early warning stations to share flood-related information with people in advance to help them prepare, launched the Melamchi Flood Fund and mobilised resources from the federal government and community-based organisations for relief and reconstruction, set up the Emergency Work Operation Centre to

report disasters and ensure a flow of disaster information, and formulated a monsoon preparedness and response plan mandated by the nodal National Disaster Risk Reduction and Management Authority. Equally importantly, the Municipality evolved a school-college curriculum exclusively related to the environment and disasters to improve disaster awareness and preparedness. The major challenge has been resources. Despite submitting a report to the federal government, the Municipality has to date not received funds for reconstruction in Melamchi. “While agriculture and social security sector easily receive grants from the federal government, a dedicated grant for disaster is absent,” pointed out Sujan Dulal. This has affected the rehabilitation and reconstruction work.

The authorities in Melamchi and Kathmandu could draw lessons from this experience about urbanisation in the context of Climate Change but significant discussions have not happened in this direction. The Melamchi flood disaster has left enough wreckage for Nepal to reflect upon about how its cities and towns should develop and expand.

*Cover photo by Dipen Dhungana: Melamchi Bazaar*



Scan the QR code to read the essay online.



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## As climate-related ailments worsen, Dhaka hospitals fail to serve the poor

Bangladesh recorded its worst outbreak of dengue this year, highlighting its crumbling and inadequate healthcare. The poor have been the worst affected – they live in areas with compromised sanitation which worsens the vector-borne disease but the cost of treatment places a huge financial burden on them. As costs restrict their access to private hospitals, sometimes even public clinics, women take the brunt of it all. The effects of Climate Change such as heat waves and flash floods contribute to the magnitude and severity of dengue outbreaks. With studies predicting a 1.13-times increase in dengue cases if the maximum temperature rises by 1 degree Celsius, the country has to seriously examine its healthcare as well as its climate response.

**Sadiqur Rahman**  
QoC - CANSA Fellow  
Dhaka, Bangladesh



The scene at the Dhaka Medical College Hospital (DMCH), Bangladesh's prime tertiary-level healthcare centre, would rival a battleground. Despite the capacity expansion from 1,700 beds ten years ago to 2,600 now, there is an unmistakable sense of overwhelm here. The hospital is packed to its gills with patients flowing in as Bangladesh has witnessed the deadliest dengue outbreak in 2023 – 2,73,078 cases and 1,355 deaths till 01 November (Government of the People's Republic of Bangladesh - Dengue Press Release) with a sharp surge of cases in August-September. The rise in vector-borne disease has been linked to climate impact.

The eighth floor of the hospital for women patients was so over-crowded in the third week of August that the authorities had to turn the hospital atrium into a large makeshift ward and assign patients to floor beds. Here, on a floor bed, lay 16-year-old Lamiya with her mother, Selina Akter, serving a frugal evening meal. Lamiya was first diagnosed with dengue on August 11 and her parents preferred to keep her at home with medicines from a local pharmacy. When her blood platelets dropped below 50,000 after about a week, the teen was rushed to DMCH. In only two days, her condition improved. She wanted to be discharged – the floor bed was hardly comfortable, there was literally a crowd around, and many male attendants.

There was another reason too. "In two days, half of my father's monthly salary has been spent," a weak Lamiya told me. Her father Abdul Matin earns Tk 14,000 [\$125] a month at a bicycle shop. The family lives in a rented house in the congested Noor Box Lane in Old Dhaka, that's a narrow alley often overflowing with sewage water where vector-borne diseases are rampant and anti-mosquito drives are irregular. When Lamiya's condition deteriorated, Matin approached the Sir Salimullah Medical College Hospital, the tertiary-level hospital 500 metres from his house but it did not have a bed. Then the DMCH was his only hope because he could not afford private healthcare.

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On paper, treatment at DMCH is almost free of cost – a patient is admitted for only Tk10 [\$0.091] – but the cost of all medicines has to be borne if the patient is not accommodated in the hospital's 2,600-bed capacity, as in all public hospitals here. Lamiya, as a 'surplus' patient, had to buy medicines and injectable saline from private pharmacies at inflated prices. During every health crisis, retail prices of emergency medicines shoot up (New Age BD). Even the green coconut, a natural source of minerals and nutrition for dengue patients, becomes costlier, as the Directorate of National Consumer Rights Protection identified (The Financial Express). "We are worried about our daughter's health but also

her treatment costs and other expenses,” says Selina.

Money is not a factor for Mohammad Eyaqub (name changed), a well-established businessman of Old Dhaka. Referred from a specialised private hospital, his wife, a dengue patient, was admitted to DMCH on August 16. He managed a bed and fluids for his wife after a *bakshish* (gift, euphemism for bribe) to hospital employees. At DMCH, the price of a dengue test is Tk50 but the long queues were off-putting for the couple, so he got it done from a private diagnostic centre where it costs Tk500; the report was delivered to her bed. The government had fixed Tk300 for a dengue test at private diagnostic centres but they frequently over-charge. With his wife out of danger in only three days, he could get her discharged from the hospital and treated at home.

The two stories show how unequal healthcare is in Dhaka, Bangladesh’s capital city. Such inequality increases the burden on the poor, and as it often happens, women nurse their

dear ones at the cost of their own health to save a few precious pennies. These consequences are harsher when Climate Change brings about conditions such as heat waves and flash floods which intensify vector-borne diseases across the densely-populated city.

Between January 1 and August 30 this year, at least 1.21 lakh people were diagnosed with dengue in Bangladesh with nearly half of them – 57,146 – only in Dhaka. Although men dominate the number of hospitalised patients at 62.2 percent, the fatality rate for women is higher at 58 percent, according to the Directorate General of Health Services (DGHS). Health Minister Zahid Maleque admitted that the delayed hospital attention for women, resulting in delayed treatment, may be responsible for higher mortality rate from dengue (tbsnews.net). The health impact of Climate Change here has a rarely-recognised gender angle.



Photo: Saqlain Rizve

*Jurain, a dengue-prone area in Dhaka, often floods in monsoon due to clogged drains.*



Photo: Sadiqur Rahman

Water accumulated under the Jurain flyover has turned into a mosquito breeding spot.

### Climate Change and Dhaka's dengue

Dhaka is one of the fastest-growing as well as the poorest megacities in the world, grappling with many public health-threatening problems such as pollution, unregulated construction work, and vehicles that are unfit to be on the streets. Moreover, continuous and unplanned rural-to-urban migration tends to generate new health risks. Such risks become severe with the inevitable impacts of Climate Change.

A World Bank study (Oct 2021) finds that Climate Change, unplanned rapid urbanisation, high population densities, insufficient preparedness, including inadequate public health infrastructure and weak vector-control programmes, are factors that contribute to the magnitude and severity of dengue outbreaks in Bangladesh.

Analysing the changing weather patterns and dengue infection rates between 2000 and 2019, the study asserts that the climate was more conducive to mosquito breeding and

disease transmission in Dhaka than in other areas when the maximum temperature was 25-35 degrees Celsius, minimum temperature above 18 degrees Celsius, and relative humidity between 60 and 80 percent.

Another study published in May this year (sciencedirect.com) predicts that the number of dengue cases will increase 1.13 times if the maximum temperature increases by 1 degree Celsius.

Similarly, the average dengue cases will increase 1.03, 1.25, and 1.07 times if the humidity, wind speed, and minimum temperature respectively increase by 1 unit, said one of the authors of the study, Momin Islam, also a faculty at the Department of Meteorology of Dhaka University.

This is among the surest link between climate-related extreme weather and the outbreak of vector-borne diseases like dengue. The poor pay the price, literally and figuratively.

## Poor patients pay more than the rich

A 2019 study (journals.plos.org) showed that the poorest families living in Dhaka city pay approximately 33 percent of their household income for healthcare while the richest only spend 5.2 percent. It also showed that the poor often cannot afford healthcare due to high treatment costs. Further, the study asserted that the wealthiest households use their regular income and savings for healthcare while poor people suffer in coping with treatment costs, sometimes borrowing from local money-lenders at high interest rates.

At Dhaka Children Hospital's dengue ward, on August 20, a weak six-year-old Marium lay recovering from dengue. Her mother Shahida, tending to her, looked tired. Little Marium, from the unplanned urbanised Anandanagar area of Mirpur, suffered from high fever for a week. Shahida initially used paracetamol at home but eventually brought the child to a nearby clinic where dengue was detected. The family then came to the government-run Children's Hospital. As its stock of

injectable saline and medicines dwindled due to 'surplus' patients, Marium's rickshaw-puller father Yusuf was forced to purchase privately. "In four days, we spent Tk10,000 on her treatment. Her father's monthly income does not exceed Tk15,000. He has already borrowed for other expenses," said Shahida.

Patients in private hospitals or clinics spend significantly more than those who used public facilities, the study showed. But as a proportion of their income, the poor who used public facilities also spent more. People's out-of-pocket (OOP) payment costs are significantly associated with their healthcare expenses. Any payment related to medical fees, purchases of medicines (prescribed or not), user fees for care and payments for equipment and diagnostic tests are included as OOP.

Mohammad Mintu, a 52-year-old small businessman in the densely populated Jurain area - Dengue Red Zone experienced the difference between private and public



Photo: Saqlain Rizve

*Bithy (3rd from right) and Mithila (extreme right) had to be hospitalised for dengue.*

hospitals. His family lives in the Fazil Sardar Pukur Par area which was a large pond 20 years ago. However, there is now no space left for rainwater retention. In every monsoon, the area as well as the ground floors of the congested multi-storey buildings are submerged due to clogged drains, breeding diseases.

On July 28, Mintu's daughter-in-law Bithy, 22, was struck by dengue fever and admitted to Mugda Hospital. Three days later, Mintu's 18-year-old daughter Mithila was also infected. In only two days, her platelets fell to 22,000. She was rushed to Mugda Hospital but the 10-bed Intensive Care Unit was filled. She was rushed to the private-run Salauddin Specialised Hospital's ICU immediately where her condition improved in five days. Mintu told me, "Mithila's treatment at Salauddin Hospital cost around Tk40,000, three times higher than that of Bithy's treatment."

Afraid of high and excessive costs, many migrants to urban slums are reluctant to access hospital or clinic services, but they hardly escape infectious diseases. The BIDS study found that people who shared accommodation, such as sublets or tenants, spend significantly more than self-owned households on healthcare expenses; the tenants are usually poor, and have a longer treatment period necessitating higher expenditure, researcher Abdur Razzaque Sarker explained.

Arjina Begum, 33, a housemaid, lives with her two sisters in Basabo which is another Dengue Red Zone. Their house is an urban slum room – a barrack-style congested accommodation facility usually occupied by lower-income families. On July 14, Arjina was diagnosed with dengue but stayed back at home. Ten days later, her younger sister Aasia Begum, garment factory worker, was admitted to the dengue ward of the Mugda General Hospital. Unwell herself, Arjina attended to her ailing sister at the hospital.

Meanwhile, their elder sister Marjina and her eight-year-old daughter, Soma Akter, were also detected with dengue. The sisters Arjina and Marjina were on floor beds in the 500-bed Mugda Hospital. "Combined, our monthly income is around Tk60,000. In one month, we have spent around Tk 1 lakh for four of us," said Marjina's husband Jakir, a government office peon.

In Bangladesh, an average 69 percent of the healthcare expenses is borne by patients themselves; only people with means can access proper medical treatment. "If you have less, you will need to either borrow money to cover up the deficits or sacrifice health. This is the real fact," said Sarker, Research Fellow (Health Economics) at BIDS, "My experience suggests that the OOP payment now has certainly gone high after the Covid pandemic because of rising inflation and income inequality."

#### Women fall through the cracks

Living in urban areas, it is presumed, offers opportunities including access to better healthcare; Dhaka has a number of health centres too. However, the city's healthcare fails not only its poor but also women from poorer communities. Housing 17 specialised public hospitals eight tertiary-level hospitals, three 500-bed public hospitals, and 10 different capacity hospitals, besides 651 registered private hospitals, Dhaka has a lot to offer in healthcare – but at a price.

Although there is no data available about the number of people at private hospitals, the Health Bulletin 2020 estimated that at least 17,58,967 women patients received outdoor medical services at 13 Dhaka-based public hospitals surveyed in 2019 while the number of women admitted as patients were only 5.49 percent of the outdoor patients (dghs.portal.gov.bd).

Earlier in 2015, a Planning Ministry's monitoring report identified the reasons behind women's discomfort in public hospitals. It found that the hospitals did not have all the characteristics of women-friendly hospitals. "The reasons for not establishing the women-friendly hospitals are absence of protocol, inadequate training, frequent change of manpower, less privacy for women and so on," the report says.

Professor Dr Sharmeen Yasmeen, former chairperson of Public Health Foundation Bangladesh, and currently Head of the Department of Public Health and Community Medicine, Bangladesh Medical College, Dhaka, observes that the existing patriarchal society is not ready to listen to physical problems of a woman. "Inaccessibility to proper healthcare sometimes deteriorates an ailing woman's health condition to the point from which recovery becomes very difficult. This happens even in many educated families," Yasmeen told me, "Women have to raise their voices."

She estimates that the death rate is higher for women dengue patients and wants the Health Ministry to conduct a death review to understand the social and economic conditions of the dead women. "Maybe we will see that in most of them, the disease was not diagnosed before their death." Urban poor women do household chores and their informal jobs as well, hiding their illness so that their day jobs are not interrupted; besides, they tend to limit out-of-pocket payments for their healthcare.

The Ministry of Health and Family Welfare has recently taken up a Tk 2,90,370 crore-worth healthcare improvement programme which promises, among other things, a drop in people's out-of-pocket healthcare expenses by 29 percent (tbsnews.net). If this comes to pass, the gap in healthcare between the poor and well-off people would begin to close.

*Cover photo by Saqlain Rizve: Mugda General Hospital*



Photo: Sadiqur Rahman

Mugda General Hospital sees a huge crowd of poor patients.



Scan the QR code to read the essay online.



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## **Pakistan's women struggle to make voices heard in Climate Change conversations**

The impact of climate-induced catastrophes doubles in Pakistani women as they are left out of the decision-making policies. Heat waves and floods have battered the country with greater intensity each passing year. Women living in informal settlements in Karachi, one of the largest cities in Pakistan, are gradually realising that the fight against Climate Change, and its consequences, is solely theirs. For a country deeply rooted in gender disparity, this means many challenges. The worsening extreme weather events will hit women harder if the country's policies do not acknowledge their vulnerability, and actively work towards adaptation and mitigation through an inclusive and sensitive approach.

**Zofeen T Ebrahim**  
QoC - CANSA Fellow  
Karachi, Pakistan



Forty-year-old beautician, Sonia Arif, mother of four, is struggling to make ends meet after her husband Arif had to shut his tailoring shop after they were unable to pay the monthly rent of Pakistani Rs 40,000. "I am sick of the yelling that has become a norm in my house for the past two years. The unbearable heat has added to my plight. In my next life, I want to be born as a man," she said.

A resident of one of the most neglected areas in Karachi, Kausar Niazi Colony, along the Gujjar nala, a stormwater drain, Sonia lost her home in 2021 in a huge demolition drive to remove encroached structures throttling the natural waterway. She and her family had no option but to live in rented accommodation.

The clogged waterway was blamed for urban flooding in 2020, when large parts of Karachi were submerged after bouts of intense monsoon rainfall which Dr Sardar Sarfaraz, chief meteorologist at the Pakistan Meteorological Department, said was a "climate-related catastrophe" due to rise in global temperature. South Asia is particularly susceptible to the impacts of Climate Change according to the sixth assessment report by the Intergovernmental Panel on Climate Change (IPCC) with the region set to experience more extreme weather conditions, including heatwaves and flash floods in the coming decades, with serious consequences for vulnerable and marginalised populations (stimson.org).

The restricted role and freedom of women in Pakistan has added to their challenges in coping with climate-related extreme events. "Climate Change impacts every element of their [women's] lives: their economic security, marital relationships, and physical well-being," finds research conducted by Urban Institute in the slums of Delhi, Dhaka, Islamabad and Lahore.

Urban planner Dr Nausheen H. Anwar, director of the Karachi Urban Lab, at the Institute of Business Administration, avers with the intersecting roles of race, class and

religion on marginalised women who are already burdened by structural dynamics such as poverty, precarious livelihood systems, housing and transportation crises. "When Climate Change intersects with these existing vulnerabilities and burdens, we find the woman disproportionately impacted," she said. However, Dr Anwar said, it was important to recognise and acknowledge that a marginalised man was as exposed to climate impacts, but in "different ways".

This was endorsed by Dr Arjumand Nizami, country director of Helvetas Swiss Intercooperation, a network of Swiss-based development organisations. "Climate Change does not differentiate between genders; both women and men are just as likely to be affected by it. But due to economic, social, political and cultural inequalities, these unevenly felt challenges are getting harder during climate-induced catastrophes," said Nizami, who is part of the organisation's global Climate Change team.

### **Regressive rules add to the suffering**

The anti-encroachment drive could not have come at a worse time for many of the working-class living in informal settlements. Reeling from a devastating flood last year and backbreaking inflation which is at 27.4 percent (in August) (Reuters) , a depreciating currency (in July the currency fell 6.2 percent) and low foreign reserves compounded by political instability, food, gas (thenews.com.pk) and fuel (pakobserver.net) prices have shot up pushing lakhs like Sonia and Arif deeper into the vortex of poverty.

Rakhi Matan, 35, lives in Karachi's Shirin Jinnah Colony, and works as a domestic help in the adjoining neighbourhood of Clifton. "A woman's work is never done," she rued, saying the only time she got to herself was when she went to bed. During power cuts, men in her neighbourhood go out of their homes, but women must stay indoors. "We don't have the luxury to go out; instead, we sit and cook in the dim light of the mobile phone, even if it gets stuffy and hot," she said.

Few think about clothing and Climate Change, but it's a lived reality for women here. "Men can be in their vests and shorts, even take off the vests; while we are forbidden to leave our homes; if we do, we have to drape ourselves in yards of cloth," grumbled Rahat Shah, 37, mother of 10, living in a three-room rented house in Gulshan-e-Sikandarabad, another informal settlement in Karachi. "Women observe purdah," said Shah, who belongs to a Pashtun community which expects strict segregation of men and women.

"There is no need for them to go out, we do all the outside chores for them," said her 22-year-old son, sitting next to Rahat. "It's not even safe, and men look lewdly," he added. Out of work, the drug addict son believed that compared to his mother and four sisters, their father, a driver in the port, works the hardest. "They just do the usual cleaning, cooking, washing," he said dismissively, admitting no male members helped with the housework. "It's women's work," he shrugged. Once he was out of earshot, his 16-year-old-sister,

Shumaila, learning to become an Islamic teacher, whispered that she did not like wearing the burqa. "It's cumbersome and stifling to walk around in it, I'd prefer covering my head with a dupatta, as it is airier, but I will never be allowed to go out like that," she said.

"Patriarchy, misogyny, toxic masculinity and repressed sexuality in Pakistani males makes life extremely difficult to be a female in Pakistan, who bear the brunt everywhere, be it urban, semi-urban, rural, mountainous areas, villages or cities," said Dr Murad Khan, professor of psychiatry at Aga Khan University Hospital's Brain and Mind Institute. "Nothing has changed -- expectations from women, their performance, or the attitude of men," he said.

"Unending house chores and elderly/ childcare is compounded by lack of safety in public spaces which keep women indoors," said Dr Anwar. Climate-related extreme weather makes it worse.



*Devastating floods, inflation and political instability have pushed lakhs like Sonia Arif deeper into poverty.*



*Rahat Shah's room in Gulshan-e-Sikandarabad is like a furnace during summers.*

### **Coping with extreme weather events**

A recent research by the Karachi Urban Lab (KUL Apr 2022) found that over the past 60 years, Karachi's daytime temperatures have risen by 1.6 degree Celsius and nighttime by 2.4 degrees Celsius. She connects the city's expansion, compaction, and densification to this rise in temperature, intersecting with global warming.

Rahat said this year was hotter than ever, and with a long power outage and huge water shortage, the situation did not get better. "We need five canisters of 20 litres (each costs Rs 35) a day for my family of 12," she said, which they use for washing clothes and utensils, and bathing. She cooks for a doctor, earning barely Rs 12,000 a month.

Living in congested informal settlements like all these women, where houses are so close to each other, that "you can literally hear each and every conversation of your neighbour,"

according to Sonia, and where too many of them live in poorly ventilated homes. "Our homes turn into infernos in summer," said Sonia. People's perception of the difference in indoor and outdoor temperature was noted down in the KUL study that was carried out during the COVID-19 lockdown (era.ed.ac.uk).

The lack of a proper sewerage system spreads water-borne diseases, especially among children. The IPCC Climate Change 2023 Synthesis Report says human mortality and morbidity as well as climate-related food-borne, water-borne diseases and vector-borne diseases have increased due to increased heat.

"It's either the fever, or stomach infection," said 29-year-old Aasia Kamran, mother of three aged 6 and 4 years and 9-month-old baby, living in a one-room quarter in Nayabad, in Lyari. Working as a part-time

house help but now on a break to take care of the baby, she said: “When they get sick, it means taking off from work for days causing additional stress as our employers get annoyed; fathers never take off from work or care for the children.”

Maria Yaqoob, 23-year-old student living in the same neighbourhood as Sonia’s, insisted the role of a woman in a village is easier than that of a one living in shanty towns of Karachi. Not only do village women have open spaces, pointed out Maria, they are self-sufficient. “They know how to make fuel from dung, carry firewood and water and are adept at running their homes. On the other hand, our lives come to a standstill if we don’t have conveniences like water, gas and electricity,” she said.

For the past two years, both Rakhi and Rahat have started cutting wood from the nearby creek for cooking “like the village women” when “we run out of gas in the cylinder”. This new task has added to their workload, said Rakhi. “It takes me an hour to collect the wood and it will last us just two or three

days.” Although it burns her eyes and she uses plastic bags to ignite the fire, knowing well these give out toxic fumes, “but with gas prices getting steeper by the day, I have little choice,” she said (Dawn).

“The urban women living in informal settlements do not have the skill sets to manage their daily chores, without modern conveniences,” admits Nizami, adding that village women are as much exposed to Climate Change than their urban counterparts.

Having worked with women in both informal settlements in cities and villages for almost three decades, she said both carried a huge, but different, workload. “But, for both, their work remains invisible and unrecognised,” she said.

While village women are closer to natural resources, they work for free on their family farm. Mismanagement, thefts and leakages in the utilities and a weak governance system have been exacerbating the impact of Climate Change on women in urban settings.



*Women in Pakistan are left out of decision-making policies related to Climate Change.*

“Coping with climate-induced heatwaves and long power outages and water shortages (both manmade) get amplified,” she said, adding: “These things are a big reason for stress among women, who are not only working at home but also employed outside.” Added Rahat, “Women have to make sure there is enough water, that the food is cooked, and the house is spotless; how they get all of it done without water and electricity is not a man’s problem.”

Zoha Alvi, an organiser of Aurat March, an annual socio-political demonstration in Pakistani cities, said political parties and public office holders should be made accountable for not carrying out their responsibilities. “They should look at the issue of Climate Change through the lens of intersectionality that needs to be acknowledged and understood as it adds more layers to this important conversation. All the issues will ultimately affect us severely.”

### **Mental health not a priority**

The IPCC report indicated that “mental health challenges” are associated with increasing temperatures, trauma from extreme events, and loss of livelihoods and culture. “With increasing social, environmental and manmade problems, the stress on women has increased,” said Dr Khan. But there was little evidence, he pointed out, to say conclusively whether the mental health of rural women was worse than their urban counterparts.

Both mental health and Climate Change are generally low on the government’s list of priorities. “When this happens, then the connection between the two cannot be made by governments, either provincial or national,” said Dr Khan, adding that the governments are engrossed in tiding over other crises - economic, power, political, security.

Dr Sajjad Ahmad, public health specialist at Koohi Goth Women’s Hospital, said that the floods in 2010 and 2022 brought to the fore how climate-induced catastrophes exacerbate women’s problems when the broken-down health centres are washed away. “The vicious cycle of poverty, lack of education, poor healthcare system and Climate Change are interlinked, and each exacerbates the other. You cannot take out women’s health and look at it through one lens alone. Poverty combined with illiteracy amplifies health issues for women, especially those who are pregnant.”

### **Designing city with Climate Change in mind**

Marvi Mazhar, an architect and climate activist, said it is critical to think of ethical land distribution, improving housing affordability and making the city more livable and breathable. “Karachi has been a power project. It’s been developed in isolation, on land-to-land infrastructure rather than zonal, neighbourhood or in a cluster form,” she said. Yasmeen Lari, 82, Pakistan’s first woman architect, heading the Heritage Foundation of Pakistan, has been designing bamboo houses for people living on the front lines of Climate Change.

Her design philosophy of “zero emissions and zero waste” ensures that the “poor are seen as partners, keeping women in the lead”. Having worked with women for years in rural areas, she says “the same principles, but with a bit of modification, can be applied in informal settlements in Karachi”.

“Our policies, programmes and projects keep little margin for climate-related events,” agreed Dr Noman Ahmed, who heads the Architecture & Management Sciences at the NED University of Engineering and Technology, in Karachi. Referring to the Karachi Development Plan 1974-85 as well as several scientific studies thereafter, he

said, the administration had been cautioned to keep the periphery of Karachi as pastoral land which was to serve as the food basket for Karachi.

“Sadly, the same territory that was to provide the ecological balance, the city badly requires today, has been transformed into real estate,” said Dr Ahmed, adding land formations such as natural hills, hillocks and water bodies have either been levelled or reclaimed for commercial development.

Mazhar called for a “democratic demarcation” where the city’s residents are given the “authority to be part of master planning and design development”. Admittedly a radical notion, this green environmental plan requires “rethinking development”.

Dr Ahmed said a cultural and lifestyle intervention was needed so that women in informal settlements were able to access public spaces and parks on a regular basis. “The concept and application of women and children-only *bagh* [park] is also a good idea,” he suggested, adding this had found resonance in some planned neighbourhoods of Karachi.

Karachi needs a domestic design system, where economics and maintenance go hand in hand, said Mazhar. This means opting out from the race for the ‘biggest city’ syndrome, she said, and giving women a greater representation on the table when decisions about the city are being made so that they could have a say on effective solutions.



Women working outdoors, like this sweeper in Clifton, Karachi, are the most impacted during extreme climate events.

But till that happens, Dr Khan suggested, women of a neighbourhood can get together, exchange notes, support each other, organise and protest. “Their collective voice can make a difference,” he said.

Maria recalls how protests against demolitions in Kausar Niazi and Tayyababad colonies united the women, who experienced the immense difficulties of being homeless at the time when the city had been facing extreme weather events. “For the first time, we realised there is strength in numbers and we voiced our protest more vociferously,” she said. And “a few hours spent in a lockup” for being part of a peaceful march gave a huge boost to her confidence, she said. “We don’t want men to speak on our behalf, we have a voice and want to be heard,” she said.

Although they failed in stopping the bulldozers from knocking down their homes, “the feeling that we were together during this tragedy was comforting,” said Maria.

The report, *Climate equity: Women as agents of change*, stresses on gender-sensitive framework for climate-related policies to work towards mitigation and adaptation. Pakistan’s overhauled Climate Change policies have “called for a reappraisal of women’s vulnerability and gender-sensitive objectives to address women’s differentiated burdens in climate stress”.

Dr Zulfiqar Bhutta, founding director of the Institute for Global Health and Development

and the Centre of Excellence in Women and Child Health at the Aga Khan University, has been researching informal settlements of Karachi and rural districts of Sindh for over two decades, primarily on women and children’s health and nutrition. According to him, many of the social disadvantages for women are compounded by misplaced social norms, restricted mobility and ingrained gender inequalities. “These can also impact the ability of rural women to adjust their lifestyle during peak summer months. For many of these issues, there is no short-term solution and bringing about a change in mindsets is challenging to say the least.

However, we must raise awareness about the impacts of Climate Change and how to adapt to extreme heat, which are now existential realities,” said Dr Bhutta.

The National Adaptation Plan, launched in July this year, has gender and youth cross-cutting themes, highlighting the integration of vulnerable groups in key decision-making bodies related to Climate Change such as climate councils, environmental agencies, and advisory committees.

For a country grappling with extreme weather patterns, it is important to focus on the vulnerable population and make women’s voices heard.

*Photos by Zofeen T Ebrahim*



Scan the QR code to read the essay online.

## QoC - CANSA Fellows

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**Arshiya Syed** is the founder of an architecture and urban design firm Studio Maqam in Hyderabad, Deccan. She is a graduate from the School of Planning and Architecture, New Delhi, and an Urban Fellow from the Indian Institute of Human Settlements in Bangalore. She is also a visiting faculty, conducting urban design and housing studio in architecture schools.

**Barasha Das** is an independent journalist based out of Guwahati, Assam. She reports on environment and Climate Change -- causes, adverse impacts, and policies to combat climate disasters. She has extensively covered every aspect of reporting on 'city'. She is also associated as a Research Writer with OnePointFive Tribe, a platform working for a Net-Zero Carbon Future.

**Chhatra Karki**, a science journalist based in Kathmandu, Nepal, has rich experience in newspaper and online news portals. In recognition of his exceptional contributions, he was honoured with the Science and Technology Journalism Award from the Nepal Academy of Science and Technology in 2021. His expertise encompasses a wide range of topics including environment, Climate Change, science, health, and current affairs.

**Harish Borah** is a subject expert in cost/carbon studies within the building industry. He is the Principal 'Carbon' Expert for ADW Developments (UK); member of GRIHA's 'Technical Advisor Committee', and Founder of OnePointFive Tribe. His works portfolio is spread across the UK/EU, the Middle East, and India. He has also been named among India's top 25 leading minds in sustainability by the Economic Times.

**Hrushikesh Patil** is a Maharashtra-based independent journalist and environmental lawyer interested in covering the impact of Climate Change-induced disasters on vulnerable communities. Currently working with the Goa Foundation as lawyer and researcher, he is also a member of the environmental communications and advocacy volunteer collective called 'Let India Breathe'. Recipient of the 12th Laadli Media & Advertising Awards for Gender Sensitivity, Youth For Coast Media Fellowship 2022 and TERRE Policy Center's Environment Journalism Fellowship.



**Kushal Pokharel** is an independent researcher and science communicator based in Nepal. His writings have appeared in leading national and international media outlets including research journals. His research interests span natural resource management, water security, Climate Change and development with a focus on public policy and governance. He also serves as a faculty of research methods and skills.

**Sadiqur Rahman**, a post-graduate of the University of Dhaka, is currently employed as a journalist in The Business Standard. His 10-plus-year career in journalism includes reporting on Climate Change, biodiversity conservation, local business, and livelihood-related issues. A member of the Thomson Reuters Foundation Alumni Club, Bangladesh, he won two anti-corruption media awards in 2014.

**Sejal Patel**, an independent journalist and documentary filmmaker currently working from Delhi, keeps a strong research focus on rural communities and data journalism, as well as the application of artificial intelligence (AI) to the fields. Patel holds a postgraduate degree in Convergent Journalism from AJ Kidwai Mass Communication Research Centre, Jamia Millia Islamia. Through her work, she aims to challenge established norms, foster social justice, and instigate transformative change.

**Zofeen T Ebrahim** is an independent journalist who has written extensively on development issues including Climate Change, urban infrastructure, water, energy, gender, and how these impact our lives. She contributes regularly to English daily, Dawn , The Guardian, The Third Pole, Thomson Reuters Foundation, and Index on Censorship.

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## ABOUT US

**Question of Cities** is India's online journal at the intersection of urbanisation, ecology, and equity. Once every fortnight, it publishes essays and ground-reported stories on cities from ecological and social perspectives, and a consistent lens of sustainability in the context of Climate Change. From natural and built environments to community chronicles, gender, and Right to the City, the journal has published more than 100 essays and ground stories from nearly 20 cities so far written by scholars, experts, journalists and community writers. It is both a forum for dialogue on these subjects as well as a repository of in-depth work. We are at [www.questionofcities.org](http://www.questionofcities.org) and on social media as @questionofcities\_ on Instagram and @CitiesQuestion on Twitter.

**Climate Action Network South Asia (CANSAs)** is Asia's largest coalition of NGOs addressing the climate crisis. With almost 300 member organisations from eight South Asian countries, CANSAs promotes sustainable climate, energy and development policies in India, Nepal, Bhutan, Bangladesh, Sri Lanka, Maldives, Pakistan and Afghanistan. Find us online at [www.cansouthasia.net](http://www.cansouthasia.net); Twitter: @CANSouthAsia; Facebook: Climate Action Network South Asia (CANSAs); and LinkedIn: CANSouthAsia

*Cover photo by Vickram Crishna: Mumbai's iconic Queen's Necklace, Marine Drive, hidden behind a shroud of polluted air.*

*Document design and layout by Shivani Dave.*