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Beyond the Blueprint: Understanding the Pathways to City Resilience in India

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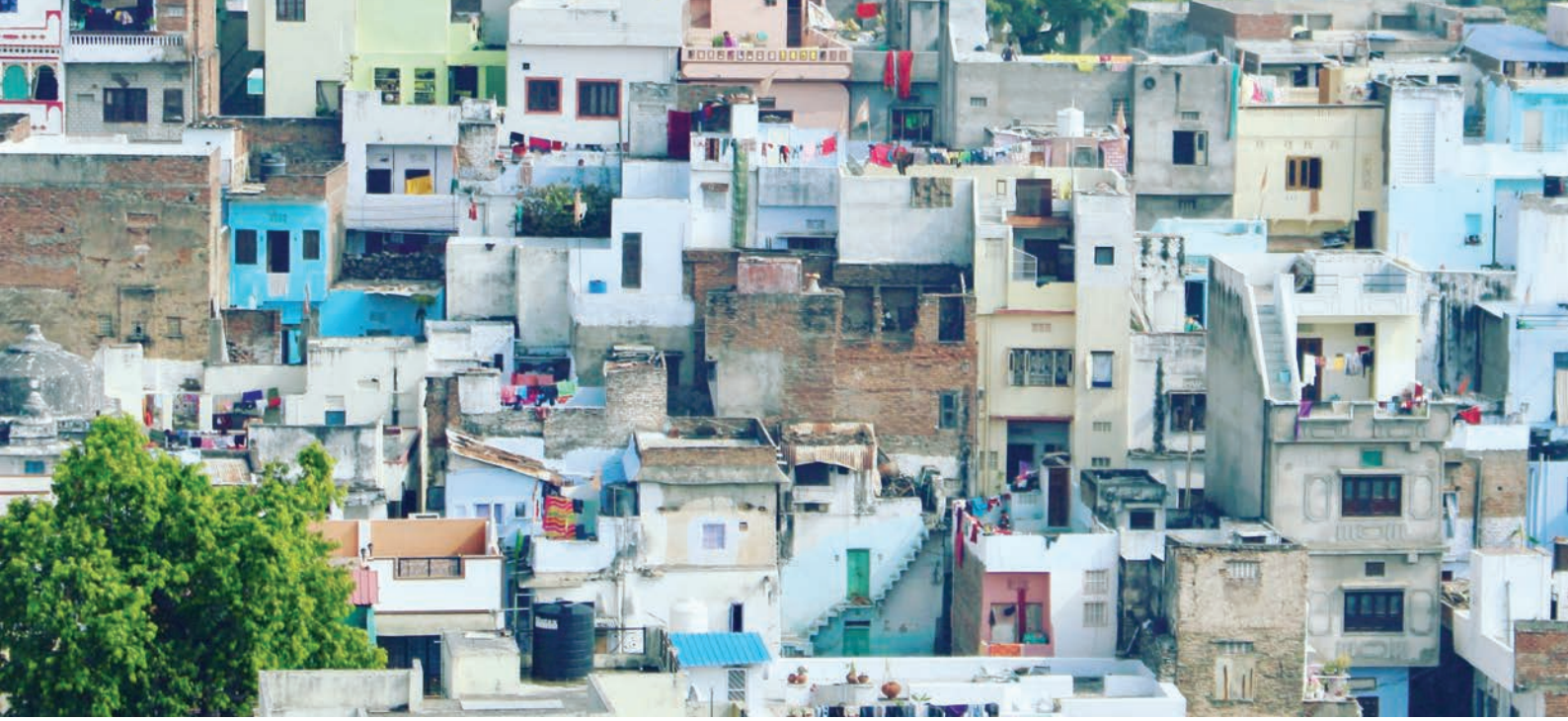
Chapter 1

The Report in Brief



Cities are centers for economic growth, critical to the vision for a Viksit Bharat 2047. At the cusp of this incredible vision, we must plan for the future to build resilient cities for all our citizens.

Urbanization has crossed an irreversible threshold. More people are living in cities than ever before since the early 2010s. This ongoing urban fold (estimated at three million more joining weekly) signifies that the city is no longer a mere backdrop but the main stage of human life, shaping ambitions, anxieties, inventions, and inequities globally and in India.

City resilience in India is more than shock absorption. It is about a city's ability to serve its most vulnerable populations. This is because shocks and stresses are often chronic structural vulnerabilities, embedded in daily existence, rather than just sudden disruptions.

City resilience must be understood as an interconnected systems challenge across four foundational pillars.

- Socio-economic Resilience to address deep-rooted vulnerabilities
- Environmental Resilience to integrate climate adaptation
- Institutional Resilience to strengthen local governance
- Infrastructural Resilience to design for climate stress and equitable access

Climate change significantly exacerbates existing urban vulnerabilities. Increased frequency and intensity of events like heatwaves and floods disproportionately affect the urban poor, impacting their residential conditions, occupational stability (e.g., outdoor workers losing wages), and health outcomes due to fragile systems and inadequate infrastructure.

Municipalities hold a critical, yet often constrained, role in building city resilience. Despite being the closest tier of government to people, their effectiveness is undermined by limited empowerment, low fiscal autonomy, and inadequate technical capacity and human resources, hindering their ability to respond swiftly to local needs.

Indian cities are vibrant spaces of adaptation and innovation. Despite simultaneously confronting significant challenges – Indian cities have exhibited good practices rising from collaborative action, with stewardship by local actors. This report highlights several such good practices from India.

> The city is no longer the backdrop—it is the main stage of human life. It holds our ambitions and anxieties, our inventions and inequities. We now live on an urban planet.

Title	Brief Description
City Spotlights	
Gangtok: Navigating geographic risks in a low resource setting	Despite being in a disaster-prone region, Gangtok has built climate resilience through measures such as slope-sensitive infrastructure, decentralized waste systems, and disaster preparedness.
Pune: Striking the balance between opportunity and overstretch	Faced with rapid urbanization, Pune has institutionalized its Sustainability Cell, e-mobility cell and participatory budgeting. Although challenges remain, partnerships and digital reforms have strengthened capacity.
Bhubaneshwar: Greening the city while navigating governance hurdles	Amidst governance challenges, Bhubaneshwar has taken pioneering steps towards urban reform such as implementing urban greening initiatives, heat action planning, and slum-upgrading through the JAGA Mission.
Surat: Learning from its past and lessons for the future	Since the 1994 plague, Surat has overhauled its sanitation, public health and governance systems, becoming a case study in municipal transformation, though high migration rates continue to remain a challenge.
Intervention Archetypes	
Rejuvenation of natural systems	Initiatives like Coimbatore's lake restoration demonstrate how degraded ecosystems can be transformed into nature-based climate buffers and public infrastructure.
Crisis response	During COVID-19, Indian cities relied on informal networks, pop-up infrastructure, and civic partnerships to deliver essential services. These crisis response interventions offer lessons for long-term resilience planning.
Community collaboration	CFAR's WASH program in Bhubaneshwar spotlights how communities can strengthen resilience by uniting stakeholders and embedding local knowledge and stewardship into city governance.
Capacity building	Pimpri Chinchwad's INR 200 crore green bond showcases how cities can build financial autonomy to fund sustainable transit.

Title	Brief Description
Philanthropist Interview	
Philanthropy in Action: The Danis on powering Mumbai's civic renewal	Jalaj and Vita Dani – long-time champions of Project Mumbai to understand their approach towards philanthropy and the role funders can play in shaping the future of Indian cities.
Organization Spotlight	
Bremen Overseas Research and Development Association (BORDA)	BORDA's climate-sensitive and inclusive WASH work showcases its waste solutions in India's small towns through legacy waste remediation, decentralized sanitation, and dignified sanitation worker infrastructure.
Urban Management Centre (UMC)	UMC's work showcases urban resilience through inclusive livelihoods, WASH, climate action, and governance reform, with a focus on vulnerable communities and institutional capacity-building across cities.
Shelter Associates	Shelter Associates' work shows data-driven, community-led approaches to improve sanitation, housing, waste management, and health in urban slums, fostering dignity, resilience, and inclusive urban governance.

Leveraging 'futures thinking' into urban planning can help provide strategic foresight, unlocking transformative and responsive solutions for building resilient cities.

- **The Pull of the Future** represents the common aspiration and motivations that can build hope and set precedents. In the Indian context, stakeholders are committed to building resilient cities that are inclusive, environmentally regenerative, socially protected, and governed by participatory, accountable institutions.
- **The Push of the Present** represents trends, patterns, and tangible drivers that are occurring in the present, while simultaneously creating futures. In the Indian context, the current policy shifts focusing on environmental priorities, social protection, and infrastructure investments are accelerating change with high growth patterns amidst persistent inequalities.
- **The Weight of the Past** represents structural barriers that create resistance to achieving the potential of the future. In the Indian context, rising urban pollution levels, unplanned growth, and high population density competing with the provisioning of basic services continue impeding progress.

Actionable solutions will emerge from collaborative efforts across all four interconnected pillars, emphasizing shared purpose among government, philanthropy, civil society, private sector, and citizens.

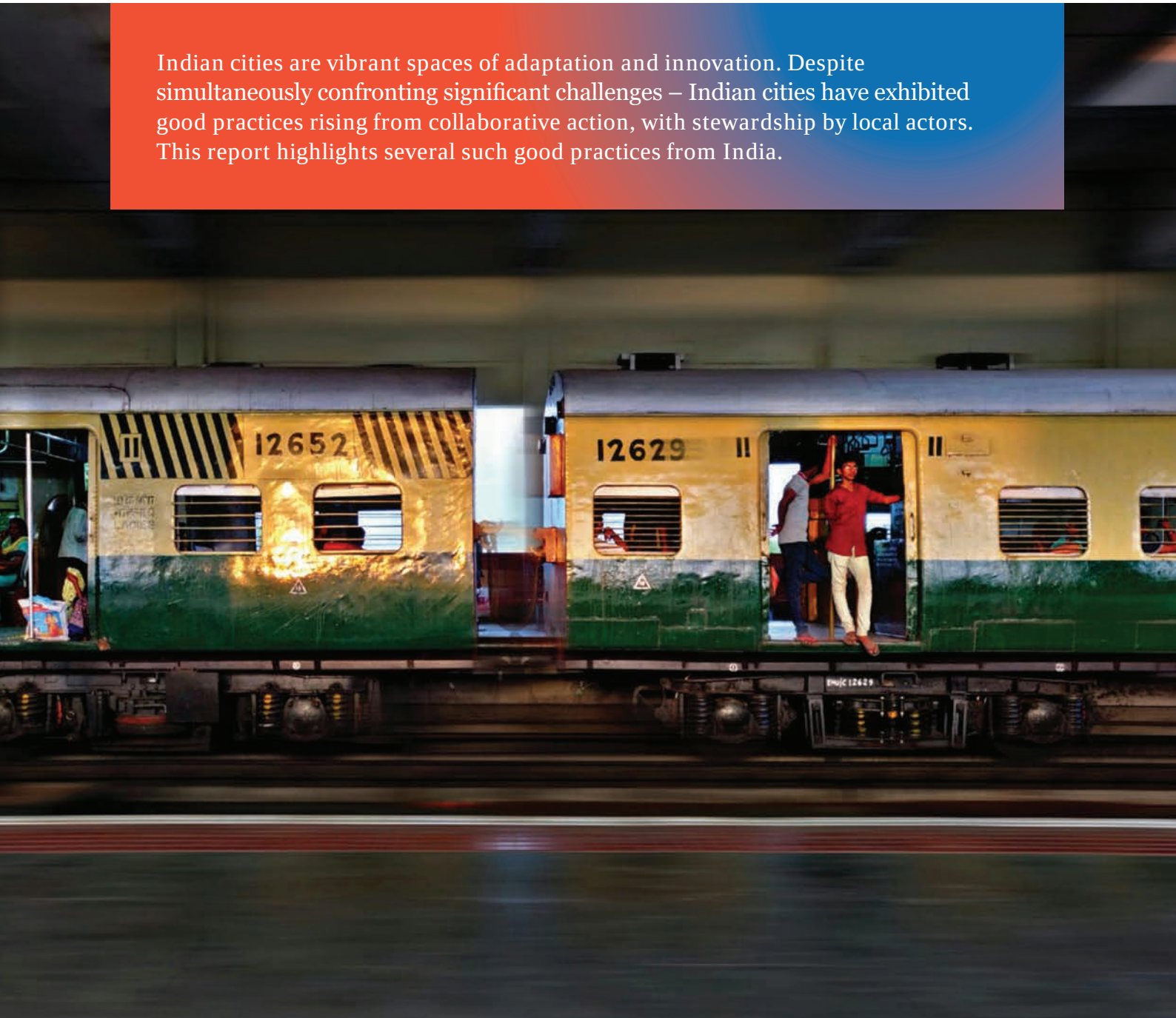
	City Councilors	Philanthropy
Socio-Economic Resilience: A city that accounts for various vulnerabilities, recognizes the importance of livelihoods, and prioritizes healthcare and education 	Consider using vulnerability maps and service assessments to guide budgets, institutionalize inclusive ward committees, and make social resilience a standing governance priority	Support digital access to services for vulnerable groups and co-develop tools with cities for mapping needs and delivering welfare
Infrastructural Resilience: A city that is designed for human centered living, embraces sustainable mobility, and one that prioritizes a circular economy with robust waste management and sanitation 	Consider forming ward committees to assess new projects through a resilience lens and explore collaborations for local composting and greywater recycling solutions	Invest in underserved areas such as climate-resilient sanitation and waste systems in smaller cities, and support coalitions that unite laborers, local governments, and service providers
Institutional Resilience: A city that has an empowered urban local body, inter-departmental coordination, and recognizes itself as a custodian of resilience 	Consider tapping into innovative financing like green bonds to fund resilience, and partner with local groups to co-create ward-level plans	Build open data and participatory governance platforms, while funding technical assistance and pooled investments to tackle systemic urban challenges
Environmental Resilience: A city that safeguards its natural systems, intentionally invests in nature-based solutions, uses data to monitor and protect its environment 	Consider advocating for integrated planning through cross-departmental teams and institutionalize taskforces to preserve urban commons, allocating some ward funds for community-led green infrastructure pilots	Bolster technical capacity in smaller cities to use data for climate planning, and prioritize funding ecological restoration in under-resourced peri-urban areas

Building urban resilience requires empowering frontline leaders with the tools, networks, and narratives. Three interlocking approaches that can catalyze change are:

- Crafting a national narrative that frames resilience not merely as risk management but as a blueprint for sustainable, equitable urban futures
- Creating platforms for municipal councilors, urban planners, philanthropists, civil society leaders, academics, and the community for cross- learning and innovation
- Building the capacity of municipal institutions, councilors, and city officials to engage with real-world scenarios, co-create solutions, and identify locally adaptable models

Resilient urban futures are an ethical proposition as much as a technical one – where cities are engines of shared resilience. It demands that resilience no longer be treated as an exercise in disaster response but as a civic responsibility, a commitment to designing cities that serve the complex, dynamic realities of the many, not the few.

Indian cities are vibrant spaces of adaptation and innovation. Despite simultaneously confronting significant challenges – Indian cities have exhibited good practices rising from collaborative action, with stewardship by local actors. This report highlights several such good practices from India.



Chapter 2

Aim, Methodology and Limitations

Aim

This report aims to break down the concept of resilience and contextualize it within the realities of Indian cities. It explores how urban systems strain, adapt, and persist in the face of both everyday and systemic shocks. Through this lens, it offers a framing of resilience across four interconnected pillars: socio-economic, environmental, institutional, and infrastructural. The report then presents a curated set of case studies to illustrate how resilience is being built in different parts of the country. These include city spotlights that demonstrate how specific cities have responded to distinct challenges and risks; intervention archetypes that highlight replicable models of resilience-building deployed across geographies; and organizational spotlights that showcase the work of civil society actors with the potential for wider adoption. In addition, the report features an interview offering a philanthropic perspective on the role funders can play in enabling more resilient and inclusive cities. The case studies are intended to serve as a catalyst for dialogue, learning, and the exchange of ideas – offering real-life examples of resilience in action, along with the challenges that accompany them. They are not meant to be an exhaustive account of all the efforts underway across India, but a window into the diverse and evolving ways in which cities are working to become more resilient.

Methodology

The findings and recommendations in this report are drawn from a mix of primary and secondary research. The primary research included conducting ~20 semi-structured interviews with a variety of relevant stakeholders including sector experts, municipal officials, civil society organization leaders, and philanthropists.

Secondary research drew from academic articles, government reports, think tank publications, media articles and reporting, and reports by multilateral institutions. Together, these sources helped build a nuanced understanding of the challenges, innovations, gaps and opportunities shaping urban resilience in India today.

Limitations

While this report draws on extensive secondary research, expert interviews, and city case studies, it is not an exhaustive representation of all Indian cities or resilience strategies. The selection of cities and interventions was shaped by data availability, access to stakeholders, and an intent to ensure geographic diversity. In some instances, quantitative evidence of outcomes was limited, requiring a greater reliance on qualitative insights from interviews and grey literature. The report is best viewed as a starting point – an entry into an ongoing conversation about what it means to build resilient, inclusive cities in the Indian context and a foundation for further inquiry and research. The case studies profiled are indicative to spotlight the landscape of efforts in the city resilience space. Therefore, please note it is non-exhaustive, and further due diligence may be needed.

Chapter 3

More Than Meets the Map: Reimagining Resilience in India's Cities

At some unmarked moment in the early 2010s, humanity crossed an irreversible threshold: for the first time in history, more people were living in cities than ever before.[1] Since then, an estimated three million more join the urban fold every week, exchanging village paths for city lights, and uncertainty for aspiration. The city is no longer the backdrop – it is the main stage of human life. It holds our ambitions and anxieties, our inventions and inequities. We now live on an urban planet.

How are cities transforming? And what does it mean to be a city?

Depending on where and who you are, cities are perceived differently: from above or below, the centre or the margins, from within or from without. For some, they are centres of mobility and growth; for others, sites of exclusion and precarity. On one hand, cities are engines of economic aspiration, drawing millions into their fold. On the other, they are increasingly fragile: strained by climate risks, overstretched infrastructure, and widening social inequity. By most measures, India's cities are undergoing a transformation without precedent—expanding faster than their capacities, growing more unequal with each addition, and facing risks that compound at every level. Is it any wonder, then, that our cities today feel too overwhelmed to deliver the expectations placed upon them? The pace and scale of change—both planned and improvised—have made it difficult for cities to fully deliver on the promises they hold, especially for those who remain at the margins of their development narratives.[2]

The resultant urban sprawl has created splintered urbanisms, where high-rise enclaves sit cheek-by-jowl with informal settlements, and lakes are paved over for luxury real estate while working-class neighbourhoods remain flood-prone.[3] Indian cities, especially, bear layered imprints of time: forts beside flyovers, markets atop ruins, and metro lines tunnelling under medieval settlements. Every corner in such a city is a site of migration and displacement, erasure and endurance, improvisation, and reinvention. Despite their centrality to economic growth, over 77% of Indian cities lack comprehensive climate adaptation plans. The most climate-exposed populations—migrant workers, slum dwellers, daily wage labourers—often remain underrepresented in the policymaking processes.

Despite their centrality to economic growth, over 77% of Indian cities lack comprehensive climate adaptation plans.[4]

Indian cities are sites of compounding crises: water scarcity and flooding in the same week; gridlocked traffic and collapsing flyovers; toxic air layered atop economic precarity. In Bengaluru, homes flood where they never used to. In Delhi, the air thickens into poison each winter.[5] In Mumbai, high tides threaten entire neighbourhoods while housing prices continue to rise.[6] Where we live, how we move, and what services we can access all shape our exposure to urban hazards. Risk maps in Indian cities double as maps of caste, class, and citizenship. What is often called a 'natural disaster' may, in truth be the outcome of several interconnected manmade decisions.

Indeed, cities are the culmination of several such intersecting, interconnected systemic consequences of how we have chosen to build — and for whom. They reflect the values in what we build, whom we protect, and whom we do not include. Who bears the brunt of pollution? Who lives closest to industrial sites? Who is most exposed to climate-related disasters, and who receives protection?

Yet for all their vitality, Indian cities are also sites of strain. By 2036, over 600 million people are projected to live in urban India.[7] But which cities will they inhabit—and on whose terms?

Gautam Bhan, an urbanist and professor at Indian Institute of Human Settlements observes, "vulnerability is not an accident of the urban poor, but a consequence of urban planning."[8] Across many cities, it is often those already marginalized—by caste, religion, income, or migration status—who are most affected, and least supported. The converging crises of climate disruption and insufficient social protections are deepening existing vulnerabilities that threaten to outpace the current grammar of urban governance. Heatwaves now arrive earlier and last longer; floods submerge both basements and blueprints. Entire neighbourhoods are at risk not just from environmental degradation but from eviction, economic displacement, and infrastructural neglect.

What we need instead is a new sensibility, a new paradigm—one that allows us to think in systems, across time, and from the margins inward. It is in this landscape that the language of resilience has taken root. Resilience, like the city itself, is a contested idea. For many Indian cities, it has become a convenient shorthand: forward-looking, fundable, and seemingly inclusive. In a country where rapid urbanization meets frequent disruption, resilience feels urgent.

Too often, it is reduced to infrastructure: flood-proof drains, solar-powered lighting, vertical gardens on concrete flyovers. These are valuable, but partial. They address symptoms without challenging the structures that produced them. A smart city is not smart if it excludes. A green city is not green if it displaces. Resilience that does not center the lives of informal workers, tenants, migrants, and women is resilience only in name. True resilience must move beyond technocratic fixes to confront the deeper architecture of exclusion. Amita Baviskar a sociologist and professor of anthropology at Ashoka University reminds us of that urban environmentalism often "serves middle-class interests while invisibilizing the working poor."[9]

Mark Pelling, professor of Risk and Disaster Reduction at King's College, London defines resilience as "the capacity of individuals and social groups to transform, rather than simply adapt, in the face of risk."[10] Such reimagination is already on the way: in informal water-sharing networks, basti-level childcare, and women's collectives reclaiming unsafe streets. The vegetable sellers changing routes after demolitions, the sanitation workers organizing for protective gear, the residents' association petitioning for better drainage – all offer blueprints for resilience. Built by the city's unseen planners, these acts of improvisation, adaptation, and endurance help cities function in ways that often go unacknowledged.

What can these blueprints teach us about building the resilience of Indian cities?

If resilience is to mean anything in India's urban future, it must begin with such recognition: of who already keeps the city afloat, and of whose futures are at stake. It must be embedded within how we govern, how we design, and how we listen. Policymakers need to see the city as it is lived in, not just planned. Planners could benefit from consulting not just engineers, but everyday experts — the street vendor, the waste picker, the tenant without tenure. Citizens, too, must ask: who is included in the idea of progress, and who is left at its margins? To make cities resilient is to make them honest about their inequalities, humble about their gaps, and hopeful enough to close them.

To see a city only through its ruptures is to miss its most radical offering: the capacity to repair. Cities endure because people do. The frontline leaders from urban local bodies ensure things happen for so many despite constraints. And when formal systems falter, informal networks emerge: in housing, healthcare, education, and care. Mutual aid efforts, neighborhood associations, and community-based innovations often step up to support diverse communities.

We must learn to see the city with layered eyes: its skyline and its shadow, its structure and its spirit. Indian cities, like their inhabitants, have always held contradictions: they are improvised and planned, ancient and modern, aspirational and precarious. We must see the infrastructure, yes — but also the intimacies: overcrowded public transport systems filled with people rushing to work, boys playing cricket in culverts, elders navigating busy sidewalks that once overlooked fields.

Cities have always embodied one of humanity's most enduring and endearing gestures: a decision to live together, in proximity, with difference.

A resilient city, then, must be defined by the effectiveness of its social contract as much as the strength of its concrete. It must be built as much through infrastructure as through intention, with governance that listens, design that dignifies, and daily acts of care by those whose labor and lives have long gone unrecognized. Even in the face of disruption, a resilient city is one that chooses to repair, to include, and to hope anew.

To see a city only through its ruptures is to miss its most radical offering: the capacity to repair.

Framing resilience through the four interrelated pillars: socio-economic, environmental, institutional, and infrastructural resilience, provides a holistic lens to understand how resilience can be conceptualized and operationalized.

Chapter 4

Finding Coordinates: Setting the Context

What is city resilience?

"...a lot of what is termed as resilience should be seen as the structural nature of inequality in urban India. It is part of everyday life, right? And if you begin from that point, then you have to realize that resilience cannot be seen in the context of forthcoming emergent risk or hazard or climate change. It is a risk that is present, and it is structural to life in our context. It is not an exogenous element. It is not a thing that happens. It is the thing."

— Gautam Bhan, Indian Institute of Human Settlements

Most definitions describe city resilience as the ability of a city to continue functioning despite the shocks and stresses it encounters. These typically refer to the city's capacity to absorb disruptions and bounce back to survive and thrive — across a range of challenges. These shocks or challenges may relate to public health, infrastructure, the economy, or the environment. It is a rather broad term that encompasses all aspects of a city that is well-functioning.

City resilience is often misunderstood as being limited to climate-related disasters or confused with disaster preparedness and post-disaster recovery. It goes beyond crisis response. Resilience is built over time. It is the slow, intentional strengthening of a city's systems — its ability to adapt, recover, and continue serving its people under both acute shocks and chronic stress.

But not every shock or stress hits everyone equally. So, in this context, how do we measure whether a city is resilient or not?

> "A resilient city is where people, including the most marginalized can have a say in shaping and guaranteeing access to basic facilities and amenities, leaving no one behind even in the face of shocks, stresses, and long-term challenges like climate change or rapid urbanization."
>
> — Dr Rajib Das, Centre for Advocacy and Research (CFAR)

In urban India, measuring a city's resilience against its ability to serve its most vulnerable populations becomes extremely pertinent. Our cities are burdened with urban distress which differs from our Western counterparts. While in the West, urban distress is characterized by a decline in social, economic, cultural, and ecological aspects of a city. In India, urban distress is often characterized by the dynamic interplay between rapid urban expansion and the evolving capacities of both public and private entities to deliver the necessary social, economic, and infrastructural frameworks that support and accommodate the growing numbers of individuals seeking economic prospects.[11, 12] Urban poverty is distinct from rural poverty and much of our cities consist of the urban poor. A large share of the city's workforce is comprised of informal workers, many of whom are migrants from rural areas. The poverty and vulnerability they experience are not just background conditions – they are 'shocks' in themselves.

Even if urban residents are not always income-poor, they often experience poverty through other forms — such as lack of access to sanitation, social exclusion, crime, insecurity of tenure and a lack of representation in governance.[13] Much of the urban population lives in slums, often under sub-human conditions of housing and sanitation. The Hashim Committee (2012) identified three vulnerabilities faced by the urban poor: (i) Residential vulnerabilities, (ii) Occupational vulnerabilities, and (iii) Social vulnerabilities.

In India, where such vulnerabilities are endemic to a significant portion of the urban population, the concept of resilience takes on a different meaning. When the 'shocks' or 'stresses' are a part of everyday existence, city resilience must strengthen the capacity to address chronic, structural vulnerabilities — not just sudden disruptions.

> "Resilience has to be seen a state to be attained by progressive elimination of (or change in) structural vulnerabilities in the system"
>
> - Dr Seetharam, Swami Vivekananda Youth Movement

Thus, resilience needs to extend beyond external shocks and respond to the existing state of being and functioning of the city itself.

Why do we need to differentiate between urban and rural poverty?

City resilience — as a mechanism to protect its most vulnerable — becomes extremely important in the urban context, because urban poverty in India manifests very differently than rural poverty. The Hashim Committee (2012) highlighted key ways in which urban poverty differs from rural poverty:

- **Livelihoods:** In rural areas, livelihoods are often to access or control over natural resources. In contrast, urban livelihoods depend on access to opportunities for wage or self-employment. The urban poor are frequently trapped in insecure, low-paid, low-productivity jobs, primarily in the informal sector.
- **Housing and Living Conditions:** A defining feature of urban poverty is the proliferation of slums and bastis. Urban poor often live in cramped, overcrowded, unsanitary, and precarious conditions, with inadequate housing and shelter, limited tenure security, and unaffordable rents. Rural areas on the other hand see more space per person and also more tenure security due to traditional landholdings.
- **Social Safety Nets:** Unlike the traditional, enduring family and community-based networks often present in rural villages that provide support, the urban poor may feel a lack of community support due to limited family or community networks.

Even the social protection offered against vulnerabilities differs in rural and urban areas significantly. India's social protection and welfare systems were conceived and developed with a strong focus on rural areas, framed by concepts like village self-rule. This historical bias meant that urban poverty was often not adequately imagined or addressed in national policy frameworks. As a result, programs and entitlements designed for the poor have historically been more robust or longer standing in rural contexts compared to urban ones. For example, the rural poor are legally guaranteed a minimum number of employment days under Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS). No equivalent legal guarantee exists for urban poor.

A recent movement in Rajasthan (as reported in media) further highlights this predicament. A few villages in Rajasthan have recently lost their rural status and were classified as urban[14]: The decision is being questioned as people are now realizing that this notification detaches them from the social protection offered under the MNREGS. While the state government has an employment scheme for the urban poor, it is not a legal guarantee. Unlike panchayats, which function at a hyperlocal level and offer a sense of proximity and accountability, municipal bodies often feel distant.

> "Panchayats may not be the most efficient, but they're more accountable — there's personal proximity. You know your representative, you can show up at their doorstep. That kind of direct pressure is missing in cities, where councilors represent much larger, more dispersed populations."
>
> - Mukta Naik, National Institute of Urban Affairs

As India urbanizes rapidly — projected to reach 40% urban population by 2036 as compared to 31% in 2011[15] — cities are increasingly seen as spaces for opportunity. They promise higher incomes, better jobs and an escape from poverty. Rising urbanization could bring with it a surge in urban poverty. This calls for urgent consideration around how cities can become spaces that mitigate poverty instead of furthering it.

How does climate change exacerbate the challenge of building city resilience?

Cities in India already struggle to meet everyday demands. Climate change adds a new layer of strain, bringing more frequent and intense weather disruptions, that further stress already fragile systems for delivering basic services.[16] While resilience efforts aim to protect the most vulnerable, climate-related events often have the most devastating impacts on these very populations. Thus, in Indian cities where resilience means safeguarding those at the margins, climate change significantly amplifies the challenge.

Increasing frequency and intensity of shocks

Climate change has led to an increase in the frequency and intensity of extreme events like heatwaves and floods.[17] Cities in India, including smaller towns, are increasingly facing these events, sometimes in areas where they were uncommon. This adds a severe and unpredictable dimension to existing vulnerabilities. For example, the early onset of monsoons in Mumbai this year caught the city off-guard and paralyzed even dependable services that act as lifelines for its population.[18]

Pre-existing Urban Vulnerabilities: Climate impacts disproportionately affect the urban poor, who already live in precarious conditions due to structural inequalities, inadequate infrastructure and planning, and limited access to services. In India, nearly one in six people in urban settings in India live in slums under subhuman sanitary conditions.

- **Residential Vulnerability:** As discussed above, urban slum dwellers often live in overcrowded and unsanitary conditions. These slums are often located in hazardous areas like floodplains, banks of drains or near dumping grounds. In such environments, even a moderate climate event can escalate into a disaster.

- **Occupational Vulnerability:** As noted earlier, a significant portion of the urban poor are employed in low-paid, insecure jobs within the informal sector, often lacking social security. Climate shocks directly threaten such livelihoods. For example, increasingly intense and frequent heatwaves put outdoor and gig workers at serious health risks. Flooding disrupts transportation and other services which can halt work, forcing many to forgo daily wages. In contexts where people already live in a constant state of precarity, climate events add another layer of instability and anxiety.

- **Health Vulnerability:** Poor living environments, including inadequate access to clean water and sanitation, contribute to chronic health issues. Climate change can worsen these problems. For instance, floods can contaminate drinking water and sewage systems, while heatwaves increase heat-related illnesses and mortality. Vulnerable groups, especially children, the elderly, and those with pre-existing conditions, are most at risk.

How can municipalities strengthen city resilience?

In the face of mounting challenges, municipalities hold a critical place in building city resilience. As the closest tier of government to the people, they are best positioned to address local issues with contextual understanding. Municipal bodies serve as key planners, implementers, and service providers. However, their effectiveness is often undermined by considerable challenges as existing capacities strive to keep pace with the increasing needs for social, economic, and infrastructural support. Rapidly growing urban centers that attract a large influx of people are further encumbered by deep-rooted systemic, financial, and institutional capacity constraints.

- **Limited empowerment:** The 74th Constitutional Amendment formally empowered Urban Local Bodies (ULBs) as the third tier of government and directed states to devolve a set of functions to them as specified in the 12th Schedule. However, in practice, this devolution has not been implemented uniformly across the country.[19] Without adequate transfer of powers, ULBs often lack the authority and capacity to effectively carry out the responsibilities assigned to them.

- **Low fiscal autonomy:** In existing studies and policy papers by the Government, it has been acknowledged that India's local governments are among the weakest in the world in terms of fiscal autonomy.[20] Municipal revenues have hovered around 1% of GDP for decades. While the aim is to reach 5%, it would still be lower than international standards. For example, municipal revenues in Brazil account for 7.4% of GDP. A large share of municipal funding in India comes in the form of grants-in-aid from the state or central governments. Often, these are tied in nature, leaving municipal bodies with little say over how large portions of it are spent. While ULBs can theoretically raise revenue through instruments such as municipal bonds, accessing these instruments (especially for smaller cities) can be difficult due to concerns around creditworthiness.

- **Inadequate technical capacity and human resources:** There is a significant shortage of technical expertise and skilled personnel within municipalities.[21] Many technical positions remain vacant, and in some cases, a single official is responsible for managing vast jurisdictions with limited support. At the same time, some positions and departments may be overstaffed. The need for the officials to engage with both market forces as well as civil society to bridge infrastructure and service delivery gaps has been widely recognized.

Resilience is no longer a long-term aspiration. It is an everyday necessity shaped by persistent vulnerabilities and systemic gaps in cities.

So finally, how do we look at resilience? And how can a city prepare?

Across disciplines — whether urban planning, disaster risk management, climate adaptation, or governance reform — there is growing consensus that resilience in cities must be understood as an interconnected systems challenge. A review of relevant literature in India and globally, ranging from climate resilience strategies to municipal reform agendas reveals four foundational pillars that underpin resilient cities. Each pillar addresses a distinct facet of urban life, but in practice, their real strength lies in how they interact and reinforce one another.

- **Socio-economic resilience:** Given the context of underlying vulnerabilities in India, socio-economic resilience involves building robust social protections at the city level. This includes safety nets, welfare programs, and other protections that support a safe and dignified quality of life. These protections address residential, occupational and social vulnerabilities.

- **Environmental resilience:** Environmental resilience involves building protections against climate related shocks. It focuses on integrating nature-based solutions and protecting ecosystems such as green cover, water bodies and air quality. This includes anticipating hazards, preparing for climate risks, and building climate-resilient infrastructure along with implementing adaptation actions like heat action plans and water resource management.

- **Institutional resilience:** Institutional resilience refers to reliable and accessible institutions that can carry out their roles effectively and remain accountable to citizens' needs. Municipalities are key to ensuring this at the city level. This means institutions are well-functioning, empowered, supported with robust administrative structures and equipped with sufficient human and technical resources.

- **Infrastructural Resilience:** Infrastructural resilience means building and maintaining public infrastructure such as water supply, sanitation, roads, housing, public spaces, that can absorb standard risks and continue to provide essential services.

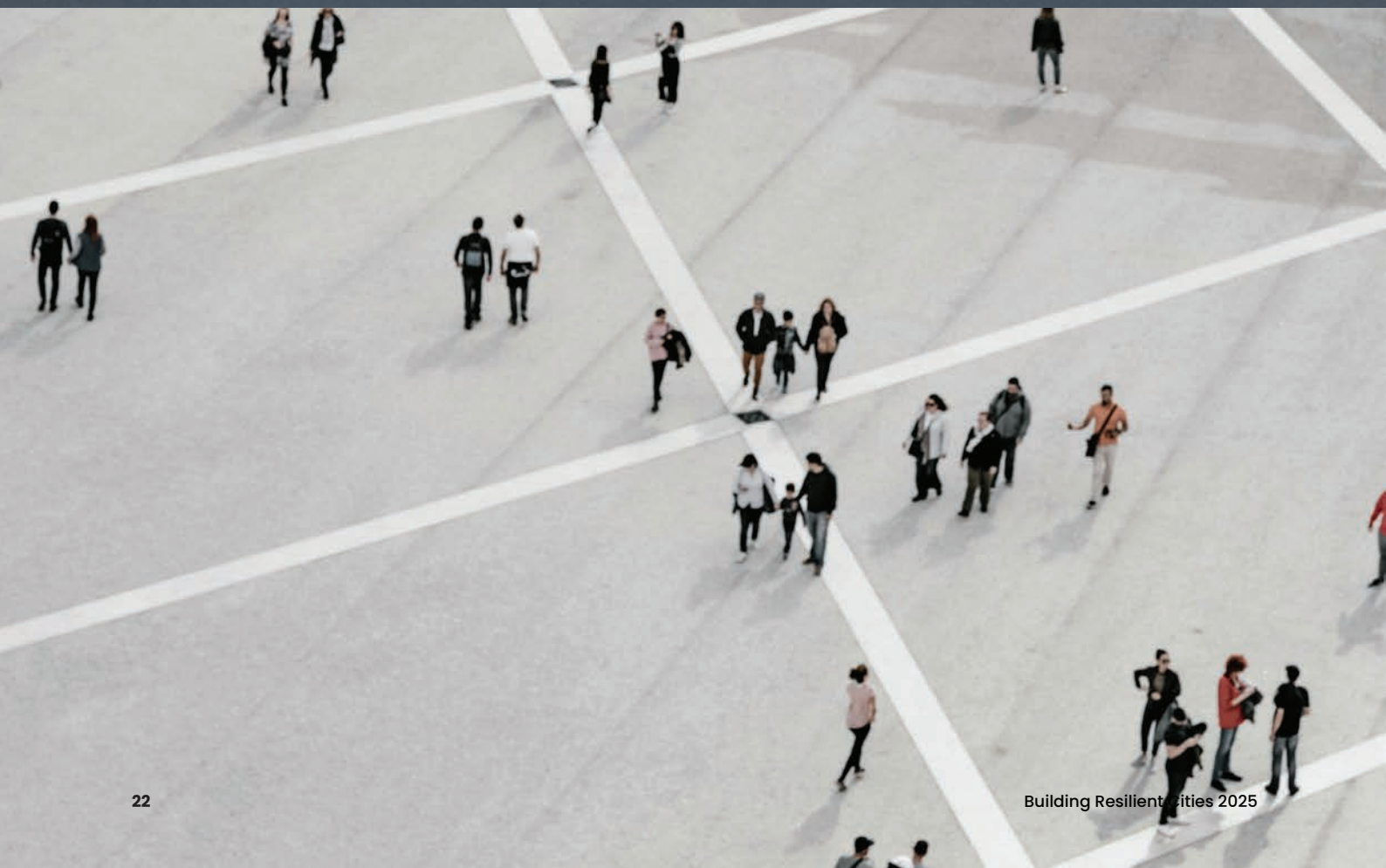
Resilience is no longer a long-term aspiration. It is an everyday necessity shaped by persistent vulnerabilities and systemic gaps in cities. Framing resilience through the four interrelated pillars: socio-economic, environmental, institutional, and infrastructural resilience, provides a holistic lens to understand how resilience can be conceptualized and operationalized. In the following section, we examine how resilience frameworks have evolved globally and in India, and the extent to which they reflect, or fail to reflect, this layered understanding.

Chapter 5

Between Gridlines: Conceptualizing Frameworks

How has the concept of city resilience evolved, in theory and in practice?

Over the past two decades, a range of resilience frameworks, both global and homegrown, have sought to provide cities with tools to understand and enhance their ability to withstand shocks and stresses. These frameworks are products of cumulative learning, shaped by milestone crises, persistent challenges, and the limitations of earlier approaches. While they differ in structure, emphasis, and application, they converge around a shared purpose: to equip cities with strategies for navigating complexity and uncertainty with greater preparedness and adaptability.



2005–2015

The era of disaster-centric resilience

In the early 2000s, resilience thinking was largely shaped by the disaster risk reduction (DRR) agenda. The Hyogo Framework for Action (2005–2015), adopted by 168 UN member states, focused on disaster preparedness, early warning systems, and building robust infrastructure.[22] Though vital, this approach was largely reactive – framing resilience around emergency response and physical damage control.

Early 2010s

A systems approach takes shape globally

By the early 2010s, the idea of resilience expanded beyond disaster response. Scholars and practitioners increasingly recognized that resilience was as much about social systems, equity, and governance as it was about infrastructural and technical robustness. This shift is best found in the Rockefeller Foundation's launch of the 100 Resilient Cities (100RC) initiative.[23]

2013

Localization of resilience thinking in India

The 100RC movement led to the appointment of Chief Resilience Officers in cities across the globe, including Pune, Chennai, Jaipur, and Surat in India, who were tasked with creating locally grounded yet globally informed resilience strategies.

2013-15

Context-driven tools for Indian cities

In parallel, India saw the development of locally relevant frameworks. The Indian Institute for Human Settlements (IIHS) had, in 2013, put forth a framework that emphasized human development, vulnerability reduction, and participatory governance as pillars of resilience.[24] The Integrated Research and Action for Development (IRADe) developed the HIGS framework, focusing on Hazards, Infrastructure, Governance, and Socio-economics. HIGS enabled Indian cities to conduct rapid vulnerability profiling, offering a pragmatic, data-driven approach for decision-making.[25]

Late 2010s

Governance as a resilience lever

Building on this momentum, Janaagraha's City-Systems Framework pushed resilience thinking squarely into the domain of urban governance reform. It reframed resilience not merely as the ability to withstand shocks, but as a function of municipal governance quality— including fiscal strength, institutional capacity, political legitimacy, and citizen participation in the Indian context.[26] This approach recognized that no amount of infrastructure investment could offset the vulnerabilities created by broken or underperforming governance systems.

2020-2024

The post-pandemic shift: equity and adaptability

The COVID-19 pandemic exposed the interconnected fragility of health systems, economies, and social safety nets. Resilience thinking expanded once again— placing explicit emphasis on social equity, health security, climate justice, and community wellbeing. Resilience was no longer just a response to physical shocks but an ongoing strategy to proactively prepare and navigate overlapping crises—pandemics, climate change, migration, and social inequity.

2024-Present

CRF 2024 and the rise of adaptive, multi-scalar resilience

Reflecting this evolution, the Resilient Cities Network released an updated City Resilience Framework (CRF 2024). Aided by the City Resilience Index (CRI), CRF 2024 retained its original four dimensions, and created a benchmarking system with 56 indicators across 12 goals.[23] Cities are now encouraged to deploy resilience strategies at multiple scales— precincts, neighborhoods, and entire urban regions and embed participatory governance and co-creation at every step. The CRF and CRI, while comprehensive, often assume a baseline of data availability, institutional stability, and technical capacity that any developing cities lack.

How do these theoretical frameworks visualize resilience differently?

Despite their different origins, urban resilience frameworks now share many foundational principles. They adopt a systems-thinking approach, acknowledging the interdependence of physical, social, economic, and ecological systems. They highlight the importance of equity, social cohesion, and inclusion—recognizing that resilience must reach the most vulnerable. Governance is another common thread, with frameworks increasingly recognizing that effective leadership, cross-sector collaboration, and transparency are preconditions for resilience.

Frameworks like the CRF and CRI are conceptually comprehensive but often data and resource intensive. Tools like the Resilient Cities Index, developed by Economist Impact, prioritize quantitative benchmarking across infrastructure, socio-institutional dynamics, and environmental performance, offering a clear picture of where cities stand but less on how they can improve.[28]

In contrast, Indian frameworks like HIGS and those developed by IIHS are grounded in pragmatism. They emphasize institutional constraints, socio-economic vulnerabilities, and the realities of the informal sector. They often prioritize diagnosis over benchmarking functions, and are designed to inform policy, not to quantify or classify cities themselves. Janaagraha's model is unique in its focus on democratic governance and city-systems reform, offering a roadmap for institutional transformation rather than just risk mitigation.

Do these frameworks reveal synergies and pathways for adapting effective strategies?

Despite structural and methodological differences, overlaps between frameworks create opportunities for convergence. Almost all frameworks prioritize health, infrastructure, economy, and governance, albeit under different labels or emphases. For example, both CRF and HIGS incorporate environmental resilience, albeit with different degrees of detail. Both IIHS and CRF frameworks stress participatory planning and social equity, while Janaagraha's framework and the Resilient Cities Index highlight institutional performance and accountability.

Cities can draw from multiple frameworks: using a global index to benchmark performance, a national framework to understand governance bottlenecks, and a local tool to design inclusive interventions. Pune's resilience strategy, for instance, used global tools like the CRF to set direction while ensuring that the informal economy, ecosystem services, and participatory governance were central to its implementation.[29]

Urban India needs resilience frameworks that recognize informal systems, fragmented governance structures, and the diversity of urban contexts. These frameworks must be flexible enough to adapt to different city sizes and governance models, grounded in data realities, and capable of building from the ground up. Only then can they meaningfully contribute to building city resilience.

Urban India needs resilience frameworks that recognize informal systems, fragmented governance structures, and the diversity of urban contexts. These frameworks must be flexible enough to adapt to different city sizes and governance models, grounded in data realities, and capable of building from the ground up.

Chapter 6

Case Studies

Indian cities, while grappling with climate shocks, infrastructural breakdowns, and chronic inequalities, are also spaces of adaptation and innovation — where stakeholders who might not ordinarily share the same table find ways to align around shared challenges.

While academic and policy frameworks often define resilience as something to be strategically designed, lived narratives from across India show it is equally something negotiated and built through partnerships among diverse stakeholders including governments, communities, industry, academia, and philanthropy. A common thread emerges; resilience is not a fixed outcome but a contextual, collaborative process—one that draws on existing social, economic, and institutional capacities to foster trust, innovation, and collective purpose. The following case studies reflect this quiet but powerful transformation in practice. They are grouped into four archetypes: City Spotlights, Intervention Archetypes, Organizational Spotlights, and a Funder Perspective to illustrate the diverse ways in which resilience is being built, practiced, and reimagined across India. These case studies exhibit that collaborative action is paramount for systemic change. The following table summarizes some of the case studies spotlighted in the report.

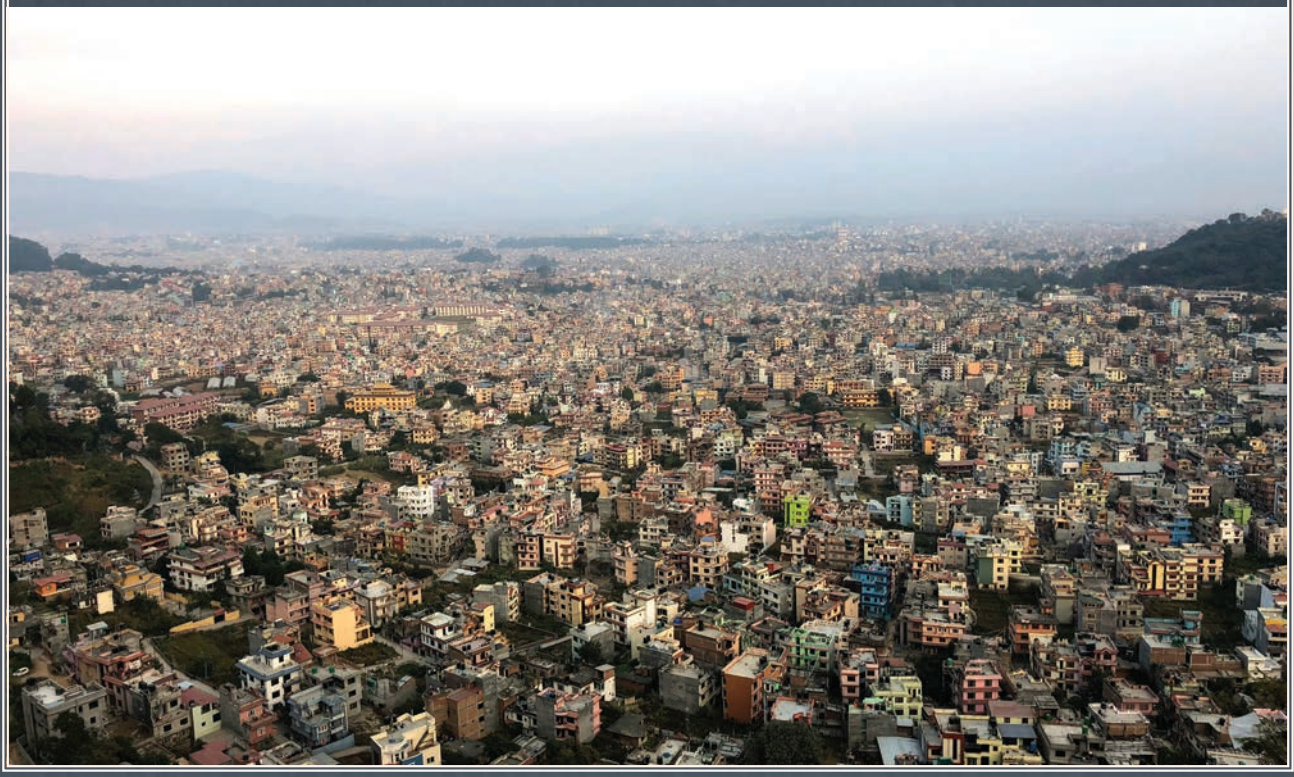


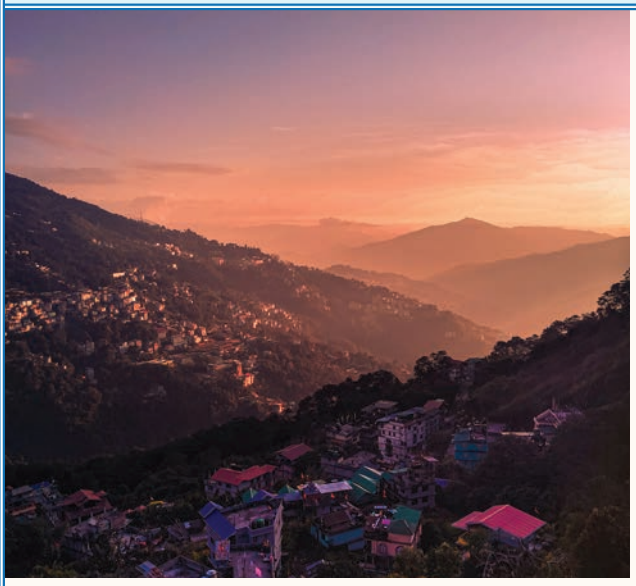
Figure 1: Snapshots of City resilience in Practice across India

Title	Brief Description
City Spotlights	
Gangtok: Navigating geographic risks	Despite being in a disaster- prone region with limited capacity,, Gangtok has built climate resilience through measures such as slope-sensitive infrastructure, decentralized waste systems, and disaster preparedness.
Pune: Striking the balance between opportunity and overstretch	Faced with rapid urbanization, Pune has institutionalized its Sustainability Cell, e-mobility cell and participatory budgeting. Although challenges remain, partnerships and digital reforms have strengthened capacity.
Bhubaneshwar: Greening the city while navigating governance hurdles	Amidst governance challenges, Bhubaneshwar has taken pioneering steps towards urban reform such as implementing urban greening initiatives, heat action planning, and slum-upgrading through the JAGA Mission.
Surat: Learning from its past and lessons for the future	Since the 1994 plague, Surat has overhauled its sanitation, public health and governance systems becoming a case study in municipal transformation, though high migration rates continue to remain a challenge.
Intervention Archetypes	
Rejuvenation of natural systems	Initiatives like Coimbatore's Lake restoration demonstrate how degraded ecosystems can be transformed into nature-based climate buffers and public infrastructure.
Crisis response	During COVID-19, Indian cities relied on informal networks, pop-up infrastructure, and civic partnerships to deliver essential services. These crisis response interventions offer lessons for long-term resilience planning.
Community collaboration	CFAR's WSH program in Bhubaneshwar spotlights how communities can strengthen resilience by uniting stakeholders and embedding local knowledge and stewardship into city governance.
Capacity building	Pimpri Chinchwad's INR 200 crore green bond showcases how cities can build financial autonomy to fund sustainable transit.

Case Study

City Spotlight 1

– Gangtok, Sikkim



The Challenge: Gangtok's uneven terrain of risk and recovery

Perched at over 1,600 meters in the Eastern Himalayas, Gangtok is the capital of Sikkim and a crucial urban node in India's northeastern region. It holds geopolitical importance due to its proximity to international borders, serves as an administrative and economic center for the state, and reflects Sikkim's broader ecological and cultural identity. As the primary hub for Sikkim's tourism, the city's largest industry is hospitality. Gangtok's resilience story is shaped by a paradox: while it champions environmental stewardship as India's first fully organic state capital, it also struggles with the pressures of rapid urbanization, fragile topography, and limited institutional capacities.

The city contends with a range of chronic stressors and acute shocks, including frequent landslides, seismic vulnerability, water scarcity, and the growing impacts of climate change such as glacial retreat and erratic rainfall.[30] Still, Gangtok stands out as a case worth examining for its efforts to harmonize tradition and innovation, leveraging local ecological values and civil society engagement to pilot adaptive, climate-conscious urban planning in a high-risk Himalayan context.

Sikkim institutionalized city-wide maintenance protocols to build environmental resilience.

Gangtok has rapidly urbanized, shifting from a sustainable agrarian economy to a service and tourism-driven one, leading to significant plastic and solid waste generation, with plastic waste alone amounting to 3.47 crore pieces annually.[31] Improper disposal of this immense solid waste in the city had previously led to blocked drainage and eventually landslides during the monsoon, causing building collapses, casualties, property loss, and slope instability; as seen particularly in the 2017 and 2023 landslides.[32]

In response to mounting waste management challenges, Gangtok has extended Sikkim's organic ethos into urban systems by institutionalizing solid waste reforms through the Gangtok Municipal Corporation. This included introduction of source segregation using color-coded bins, door-to-door collection – partially outsourced to NGOs and Self Help Groups (SHGs) – and decentralized composting at sites. ICLEI South Asia's climate resilience project helped implement a pilot bio-composting plant at Kanchenjunga Shopping Complex, which processes around 600 kg of organic waste weekly into compost, sold locally and reinvested, thereby reducing landfill pressure, cutting fossil fuel use, and protecting water bodies from drainage blockages.[33]

Through investment in slope-sensitive and green urbanism, Gangtok has bolstered infrastructural resilience.

The local rugged topography and limited buildable land also pose serious constraints to urban infrastructure development, increasing the risk of landslides, poor drainage, and mobility challenges. To address these issues, the Urban Development and Housing Department (UDHD) introduced slope-sensitive building regulations, rainwater harvesting mandates, and hill-friendly pedestrian infrastructure such as stairway systems and non-motorized corridors.[34]

These efforts have been strengthened under the Smart Cities Mission, with investments directed toward dedicated pedestrian corridors, solar-powered public lighting, and stormwater upgrades adapted to Gangtok's challenging topography (e.g. MG Marg), which is fully pedestrianized and records the highest footfall between 5 to 9 PM, standing as a model of low-carbon urban mobility for other Himalayan cities.[34]

Gangtok has strengthened institutional and governance capacity through preparedness strategies and collaborative partnerships.

Gangtok's institutions have historically faced limitations in technical capacity and fragmented responses to recurring disasters such as landslides and erratic rainfall. To address this, the city has significantly strengthened the role of the District Disaster Management Authority (DDMA), which now conducts regular risk assessments, public awareness campaigns, and emergency drills, particularly in vulnerable zones like Tadong, Development Area, and Lower Sichey. Gangtok hosts India's second Internet-of-Things-based real-time landslide warning system, set up near Chandmari village with over 200 sensors spread across 150 acres, capable of warning 24 hours in advance, providing critical lead time for evacuation and safeguarding at least 5,000 residents.[35]

As mentioned earlier, participation in the Smart Cities Mission was intended as a major turning point. The many projects under the program included an Integrated Command & Control Centre (ICCC), enabling real-time coordination across departments, tracking rainfall, traffic, sanitation, and emergency response, by integrating data from smart poles, CCTV networks, and sensor-based monitoring systems. Such coordinated action speaks to the importance of institutional resilience, the capacity of local institutions to anticipate risks, mobilize resources, and effectively implement preparedness strategies. Municipal and district-level bodies in Gangtok are increasingly central in delivering services and managing urban risks.

The city has also positioned itself as a testbed for green innovation, converging environmental and infrastructural resilience by integrating sustainable technologies into essential services and energy infrastructure. Initiatives such as the proposed Green Hydrogen Smart City Pilot (2023), promoted by the Sikkim Renewable Energy Development Agency, aim to transition urban energy systems away from fossil fuels, adding a climate mitigation dimension to Gangtok's resilience efforts.[36]

Gangtok's Smart Cities initiatives have encountered persistent setbacks: key projects like the Rainwater Harvesting System (launched September 2018) experienced significant implementation delays and under-utilized their budgets; inter-agency silos slowed overall mission roll-out; and peri-urban wards (e.g., Tibet Road, Lower Sichey, Ranipool) remain underserved by sanitation, drainage, water supply, and waste-management networks, creating entrenched equity gaps.

Key Takeaways

1. Institutional coordination strengthens local response:

Gangtok's experience highlights how district and municipal bodies, when given clear mandates and resources, can play a central role in risk reduction and service delivery.

2. Technology is most impactful when embedded in local contexts:

Sensor-based early warning systems and bio-composting plants were effective where paired with community awareness, training, and integration into existing workflows. Their success depended not just on innovation, but on adaptation to Gangtok's terrain, risks, and governance landscape.

3. Peri-urban areas remain underserved despite flagship missions:

Despite advances under the Smart Cities Mission, several outer wards of Gangtok continue to face gaps in drainage, sanitation, and waste management. This signals the challenge of reaching beyond central business districts, and the need for more spatially inclusive planning.

4. Blending ecological values with urban planning creates long-term resilience pathways:

Gangtok's organic ethos and hill-sensitive urbanism through slope-aware building regulations and decentralized waste systems demonstrate how cultural and environmental identities can shape innovative approaches to resilience in high-risk geographies.

Case Study

City Spotlight 2

– Pune, Maharashtra

The Challenge: Striking the balance between opportunity and overstretch

Situated at the western edge of the Deccan Plateau, the city of Pune covers an area of 516.18 sq. kilometers, serving as the administrative headquarter of the Pune district and division. Home to 58 wards governed by the Pune Municipal Corporation (PMC), its metro population surged from 3.1 million in 2011 to over 7 million in 2025, underscoring its magnetic draw for students, professionals, and migrants alike. Pune's governance and infrastructure have struggled to keep pace with its expansion. Even with a municipal budget of INR 12,618 crore for 2025 – 26, and a dedicated department on climate action, basic ward-level services such as pothole-free roads, reliable sanitation and well-maintained parks remain uneven.[39, 40] Environmental buffers have also been compromised: built-up area grew by 12% between 2013 and 2022, shrinking natural drainage and triggering flash floods in low-lying wards during intense monsoon rains. Meanwhile, 34% of Pune's carbon-sequestration potential has been lost to development, and summer temperatures now routinely exceed 40°C, overtaxing water networks and heightening heat-related health risks amid growing informal settlements.[41,42] Therefore, Pune's move from one-off environmental efforts to integrated, cross-departmental climate governance demonstrates how municipal bodies can embed resilience into routine processes.

Pune's Sustainability Cell has integrated climate-sensitive decision-making to build environmental resilience.

Recognizing that its environmental efforts were fragmented and vulnerable to personnel changes, Pune sought a structured resilience pathway by joining the Rockefeller Foundation's 100RC network in 2016.[43] This partnership led to the appointment of a Chief Resilience Officer (CRO) and the creation of a city-level strategy that would ultimately underpin the launch of PMC's Sustainability Cell.[44]

"An expert emphasized that the institutional knowledge embedded in local officials is needed to advance resilience as an agenda. However, in the absence of clearly defined mandates, resilience-building often becomes an additional charge for departments such as gardening or solid waste management, further diluting both focus and effectiveness."

Against this backdrop, Pune's Sustainability Cell was established in 2020 without much publicity. The Cell both preceded and informed similar efforts, including the Pimpri-Chinchwad Municipal Corporation's (PCMC) launch of a Sustainability Cell in 2023.[45] The decision to frame it as a 'sustainability'-focused cell, rather than a narrowly climate-focused one, was strategic. It allowed the unit to encompass environmental planning, infrastructure design, public health, and emissions governance, while also influencing the state to mandate "climate action cells" across Maharashtra via a Government Resolution.[46]

By 2023, with foundational reforms in place, including a greenhouse gases inventory and early pilots, PMC formally launched a Climate Action Cell, with a more focused mandate on carbon neutrality, international partnerships, and measurable targets.[47] Its functions include managing programs like the National Clean Air Program (NCAP) and steering city-level emission reduction efforts, with goals aligned to reduce particulate matter by 20–30% by 2024.[44]

Notable outcomes include the procurement of over 220 electric buses, operated by Pune Mahanagar Parivahan Mahamandal Limited (PMPML) under the FAME-II scheme and state subsidies; and the integration of rooftop rainwater harvesting into key public buildings and infrastructure, which has enabled the recharge of over 5 crore liters of water annually across 74 civic buildings.[48,49] The planting of over 80,000 native saplings, part of the Van Mahotsav initiative, aims to mitigate urban heat while enhancing ecological resilience.[50] New institutional units like the E-mobility Cell and Groundwater Cell have also emerged in recent years, catalyzed by the upstream coordination efforts of the Sustainability Cell.[51,52] Amidst mounting environmental pressures, such consistent effort reflects a growing sense of internal ownership and adaptive governance, both essential to institutional resilience at a city scale.

Pune's commitment to bolstering governance protocols through participatory approaches to budgeting, inclusive engagement etc. has strengthened institutional resilience.

Pune's push for internal reform reflects a recognition that resilient cities need robust back-office systems. The city has digitized its internal workflows, launching an e-office system in early 2023, that, as of mid-2025, is used by just 15 of 60 departments despite INR 50 lakh investment and a commissioner's mandate for full rollout; SPARROW (Smart Performance Appraisal Report Recording Online Window) and a SAP-ERP integration are slated to follow, aiming to automate appraisals and unify financial operations.[53,54]

In the broader metropolitan region, PCMC has institutionalized participatory budgeting since 2013, dedicating 10% of the previous year's property tax per zone to citizen-driven projects. In 2024, inputs moved online, collected via QR codes on the Smart Sarathi app and PCMC website, boosting convenience and broadening engagement, and offering a template for inclusive planning across municipal bodies.[55]

Leveraging the ecosystem of knowledge institutions and civil society actors has contributed to Pune's resilience architecture.

Prayas Energy Group's technical guidance on grid improvements and low-carbon pathways has enhanced electricity reliability across wards.[56] Organizations like Parisar's and other citizen-groups' inputs laid the groundwork for pedestrian- and cycle-friendly streets, leading PMC to inaugurate India's first dedicated Cycling Department in early 2025 , tasked with

designing protected lanes, installing bike stands, and piloting community-led rallies.[57,58] However, about 100 of the proposed 300 km of cycle tracks planned, has been laid by mid-2024, and Institute for Transportation and Development Policy's assessment found just two streets meeting Urban Street Design Guidelines, with many tracks encroached or poorly maintained.[59,60] This signifies the governance-related operational hurdles that Pune must overcome to fully realize its non-motorized transport ambitions.

Pune's pioneering SAFAR air-quality dashboard, live since 2011, now feeds real-time PM2.5 and PM10 data to digital screens at schools, clinics, and transit hubs, underpinning adaptive transport and public-health intervention.[61] Building on this, the 2025 rollout of an illness-surveillance system mandates respiratory case reporting via the Integrated Disease Surveillance Program, enabling targeted advisories and rapid infrastructure responses such as temporary cooling centers and dust-suppression measures, against escalating climate-health threats.[62] These systems can enable early warnings, targeted advisories, and preemptive public health measures, laying the foundation for risk-informed, adaptive infrastructure in response to intensifying climate-health risks.

Pune fosters socio-economic resilience by formalizing waste livelihoods through SWaCH and piloting affordable housing for low-income migrants.

Despite handling most of Pune's solid waste, informal waste pickers have long lacked formal recognition and job security. In response, the SWaCH cooperative was formed to integrate over 3,850 predominantly women waste pickers into PMC's waste collection system. Today, SWaCH diverts around 220 tons of waste daily, cutting 100,000 tons of carbon dioxide emissions and has been hailed as a "green-work, pro-poor partnership" for turning waste collection into dignified, climate-positive employment.[63]

But even a successful model like SWaCH faces challenges, revealing the fragility of institutional arrangements without long-term support structures. It has been reported that the cooperative is vulnerable to operational pressures such as delayed payments, contract insecurity, and political pushback from private waste contractors, underscoring the need for strengthened institutional protections and guaranteed funding lines.[64]

Every year Pune draws new arrivals – students, professionals, laborers – who together contribute to nearly half of the city's population growth since 2011, over 1.5 million people; however, most of them lack secure rental housing and basic services.[65] To address this, PMC's 2024-25 budget earmarked a pilot rental scheme in Baner, repurposing flats built under Pradhan Mantri Awas Yojana (PMAY) and slum-rehabilitation projects for short-term leases of one to two years, with income criteria to target low-earning migrants.

However, while the pilot received 908 applications, approvals were given for only 24 (2.6%), a gap attributed to high regularization charges and restrictive eligibility criteria. The corporation also earmarked 21 acres in Gultekdi for affordable housing and slum rehabilitation, plans still to be implemented.[66] This stark mismatch between demand and delivery supports the urgency of scaling inclusive housing interventions to bolster socio-economic resilience. Nonetheless, this early proof-of-concept can prompt PMC to review its eligibility criteria and grow institutional commitment to inclusive housing solutions and socio-economic resilience.

Even as Pune builds a compelling case for urban resilience with embedded climate action and cross-sector partnerships, new challenges continue to surface as the city grows.

Key Takeaways

Commitment to cross-departmental coordination:

Embedding new environmental or other resilience initiatives requires explicit coordination mechanisms. Pune's Sustainability Cell succeeded when it secured formal coordination forums and joint work-plans between departments, not merely by existing as a standalone unit.

Mandates must be backed by authority:

Without by-law or budgetary requirements to channel projects through the Sustainability Cell, climate action risks remaining advisory. Pune shows that clear terms of reference and funding are critical to operationalize resilience.

Iterative pilots fuel systemic change:

Small-scale experiments, whether the Baner rental-housing pilot or the first 100 km of cycle tracks, can surface design flaws, build political support, and inform course corrections, thus catalyzing broader institutional reforms.

Synergy of top-down and bottom-up:

Resilience hinges on both municipal reforms and grassroots action: SWaCH's waste-picker cooperative in Pune and its citizen-led participatory approach demonstrates how partnering with CSOs can amplify institutional capacity and bolster urban resilience. Shelter Associates (spotlighted in detail in the next section) is an example of CSO's partnering with urban local bodies to address sanitation and rehabilitation in informal settlements.

Inclusion at peripheries is non-negotiable:

As Pune's municipal area expanded to encompass dozens of surrounding villages, chronic gaps in drainage, road maintenance, and service delivery revealed that true resilience demands extending formal planning, dedicated budgets, and clear inter-agency protocols to the city's newest edges.[67]

Case Study

City Spotlight 3

– Bhubaneshwar, Odisha

Greening the city while navigating governance hurdles

The Challenge: Ground realities as hurdles to greening and governance

The modern city of Bhubaneswar was developed in 1948-49, to shift administrative functions away from congested and flood prone Cuttack. Over the years, Bhubaneswar has witnessed astronomical population growth, in tandem with increased environmental stresses of cyclonic storms, urban heat islands, and rapid infrastructure expansion.

These intersecting pressures disproportionately affect informal settlements and highlight the urgent need for systemic coordination and climate-responsive planning. As a result, the city has deployed targeted strategies to mitigate these risks, experiencing varied successes, and embodying lessons for cities across the country to take notice.

Bhubaneswar has built comprehensive afforestation and heat management strategies to build environmental resilience.

Concrete-heavy infrastructure, disappearing wetlands and forests, traffic congestion, and poor housing quality all contribute to rising ambient temperatures in urban areas. The result is a built environment that amplifies heat stress, particularly for already vulnerable populations. A temperature-mapping survey conducted by International Forum for Environment, Sustainability & Technology (iFOREST) across all 67 municipal wards of Bhubaneshwar, found 40 zones suffering from elevated heat risk.[68]

Case Study - City Spotlight 3 - **Bhubaneshwar, Odisha**

Notably, three wards within the Salia Sahi settlements – the largest urban slum in the state, spanning 256 acres and housing over 100,000 residents – were classified as "extreme high risk," with average roofs of corrugated metal exacerbating heat exposure. In response, Bhubaneshwar Municipal Corporation (BMC) launched a plantation drive during the monsoon season, prioritizing cyclone-resistant native species and establishing five Miyawaki mini-forest patches with an 80 % survival rate. The early success of the Miyawaki forests is evident in their faster growth, 1.5 to two feet taller than traditional plantings; and multiple climate benefits, including microclimate regulation, dust reduction, carbon absorption, and groundwater recharge. As a result, plans are underway to replicate this model at 20 additional sites to help meet WHO guidelines on green space per capita.[69] However, it must be noted that while Miyawaki do have their advantages, they are not a substitute for natural ecosystems.[70]

Recognizing the need for broader impact, the BMC has pledged nine mini-urban forests amounting to approximately 26,000 trees across multiple zones under a program aligned with the NCAP. The program leverages Miyawaki's thick multi-layered planting to maximize density and survival in confined urban spaces, delivering tangible improvements in shading, air quality, and urban biodiversity.[71] In the Ananda Bana project, the Forest Department and Bhubaneswar Development Authority (BDA) introduced a 1.5-hectare Miyawaki forest with over 12,000 native trees, equipped with barcode tags for public engagement in biodiversity awareness.[68]

Complementing greening efforts, a Heat Action Plan co-developed by Integrated Research and Action for Development (IRADe), Indian Institute of Public Health, Bhubaneswar, and Odisha State Disaster Management Authority (OSDMA) sets thresholds for heat alerts and details measures ranging from hydration stations to public advisories. Its implementation is driven by municipal leadership and local health agencies to protect vulnerable groups.[72]

This multi-pronged approach highlights how integrating nature-based solutions with institutional planning can aid in not only mitigating environmental risks but also enhancing community well-being and ecological health. The initiative's strong survival rates, public engagement, and alignment with broader policies underscore key lessons of localized data, inter-agency coordination, and sustained green infrastructure investment as critical steps towards replicable climate adaptation in other Indian cities facing rising heat extremes.

Bhubaneswar's shift toward sustainable mobility, and green transit is an inclusive step towards infrastructural resilience.

India's urban design has long prioritized auto-centric grey infrastructure, wide roads, flyovers, and parking lots, at the expense of walkability and non-motorized transit. This has led to cities that are valuable to ever expanding petro-economy, but at the cost of making them unwalkable, unsafe for pedestrians and cyclists, and environmentally unsustainable. In Bhubaneshwar's neighbouring Cuttack, auto-centric planning has resulted in hazardous conditions for pedestrians: with major junctions receiving zero-star safety rating for lacking in basic infrastructure.[73]

The Mo Cycle Public Bicycle Sharing (PBS) system, launched in late 2018 via a partnership between Bhubaneswar Smart City Limited, Capital Region Urban Transport, and operators such as Yulu, Yana, and Hexi, initially deployed around 2,000 GPS-enabled bicycles across 400 docking stations.[74] Designed to support last-mile connectivity with the Mo Bus network and reduce emissions, Mo Cycle integrated digital features like QR-code unlocking and app-based payments, and even included cycle designs suited for a wide demographic.[75]

Case Study - City Spotlight 3 - **Bhubaneshwar, Odisha**

Though designed to support travel efficiency and emissions reduction, post-launch evaluations highlighted persistent problems: lack of dedicated cycling lanes, inconsistent maintenance, and inadequate station placement undermined usage. Infrastructure gaps led to ridership declines, illustrating the necessity for protected cycling lanes, secure zones, and better integration with transit. The attempt, and subsequent shortcomings underscore a crucial lesson: introducing sustainable transit solutions is not enough, Indian cities must also invest in the supportive infrastructure, like protected bike lanes and walkable streets, that makes such systems viable, safe, and inclusive.

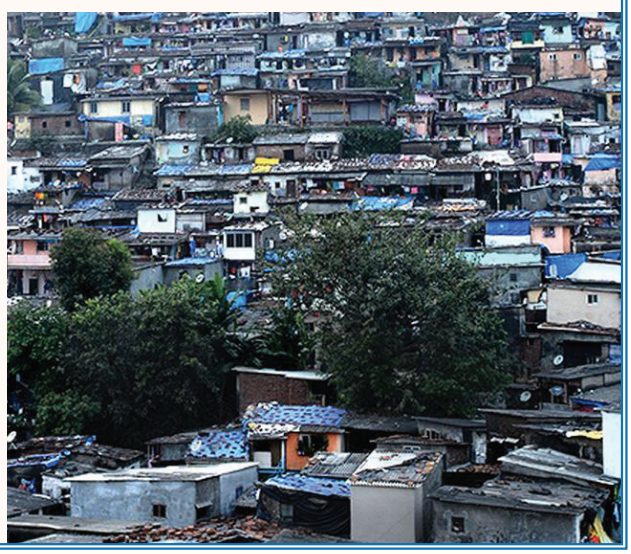
Bhubaneshwar is building socio-economic resilience through community-led governance models that embed tenure security, participatory planning, and grassroots leadership.

While decentralization frameworks such as the 74th Constitutional Amendment formally recognize ULBs, Indian cities, as discussed above, often continue to operate with limited administrative and financial autonomy. Key functions such as staffing, budgeting, and long-term planning remain concentrated at the state level, constraining the ability of municipal governments to act independently or respond swiftly to local needs. This implementation gap denies cities' meaningful autonomy and community-rooted systems of accountability. Bhubaneswar's improvement in the Swachh Survekshan rankings over recent years offers a striking example of how institutional resilience can be strengthened even within a constrained governance environment through redistributing agency to the grassroots.[76]

Through complementary initiatives like the Socially Smart Slums program (2017–2022), supported by United Nations Population Fund (UNFPA), youth and women leaders received training in civic processes, hygiene awareness, grievance redressal, and the oversight of public works.[77] These trained representatives worked directly with municipal officials to report gaps, conduct community audits, and facilitate behavior change at scale. As a result, slum-level sanitation saw measurable improvements, contributing to the city's upward trajectory in national cleanliness assessments by embedding operational responsiveness where most needed.

Through the implementation of the Odisha Livable Habitat Mission, popularly known as the JAGA Mission, the city has recognized security of tenure, participatory planning, and community leadership as vital levers. Each slum has been a cornerstone of this process, offering residents not only a collective voice but also formalized roles in slum upgrading and service delivery.

This is done through the formation of Slum Dwellers Associations (SDAs), composed of local residents, with at least half of their members being women. In Bhubaneswar's 50 Smart City slums, these associations have become sites of both institutional engagement and social transformation. Many members, especially women, have emerged as community leaders after undergoing capacity-building as Youth Peer Leaders under the Socially Smart Slums program (2017–2022), supported by UNFPA.[78] Their training and association with SHGs provided women with both the confidence and practical tools to engage in planning, negotiating with officials, and monitor the implementation of civic projects like road and drainage works.



Case Study - City Spotlight 3 - **Bhubaneshwar, Odisha**

A significant evolution in Bhubaneswar's urban resilience strategy has come with Phase two of the JAGA Mission, which explicitly focuses on slum-proofing the city. This shift marks a transition from reactive slum rehabilitation to a more proactive model that aims to prevent the emergence of new slums by embedding planning safeguards into the city's growth.[79] Under this phase, only slums located on untenable land, such as low-lying flood-prone areas or restricted public lands, are considered for relocation. Even in such cases, the process is highly consultative: resettlement occurs only with the informed consent of at least 80% of the residents, and new sites are designed through co-creation workshops where residents determine plot layouts, housing types, and the placement of community infrastructure.

Bhubaneswar's climate adaptation and urban transformation efforts have encountered several contextual complexities: coordinating across multiple agencies with evolving mandates; transitioning from car-focused planning to more sustainable mobility models like Mo Cycle; managing the impacts of increasing heatwaves alongside a gradually shrinking green cover in informal settlements; and continuing the process of administrative decentralization to strengthen local planning and financing capacities. Still, there are important takeaways that can inform Bhubaneswar's ongoing resilience journey.

Key Takeaways

1. Leveraging Localized, Data-Driven Strategies:

Heat mapping and Miyawaki foresting demonstrate how context-specific ecological and community data can guide adaptive interventions.

2. Pairing Infrastructure with Supportive Design:

Bike-share systems require safe, dedicated lanes; nature-based solutions need long-term stewardship plans and land-use safeguards.

3. Enabling Community-led Co-governance:

Institutionalize community platforms to enhance responsiveness and accountability within existing state–city power structures.

4. Collaborating for Collective Resilience-Building:

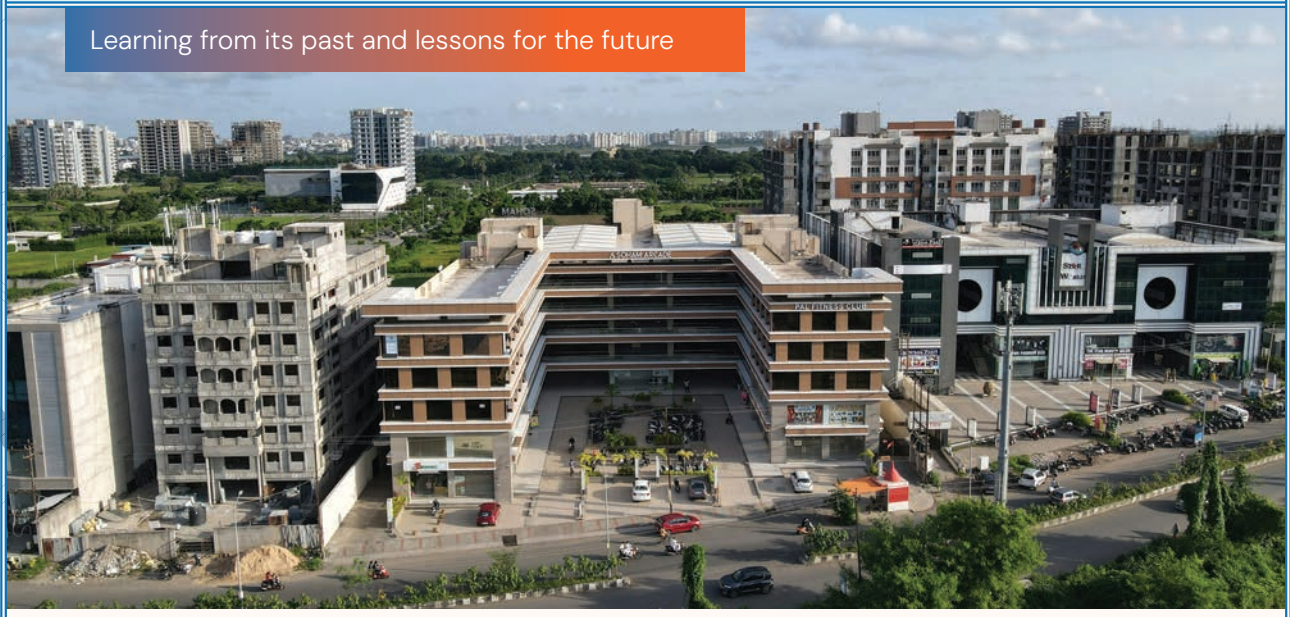
Invest simultaneously in human capacity, ecological restoration, and infrastructural reform, recognizing that institutional strength grows through incremental, trust-based coordination.

Case Study

City Spotlight 4

– **Surat,** Gujarat

Learning from its past and lessons for the future



The Challenge: Surat's industrial expansion and urban strain

Surat is proximate to the Arabian sea, situated in the western coast of India, in Gujarat. Located along the Tapi river, it is a major economic center of the state. It serves as a major hub for textiles, diamond polishing, and trade. The city boasts of many contributions to the country's economic growth, accounts for 42% of the world's total rough diamond cutting and polishing.

The city has a tropical savanna climate, and being along the Tapi river makes it prone to flooding, especially during the monsoon, and increasingly vulnerable to climate-induced risks like heatwaves and vector-borne diseases. Given Surat's economic nature, its demography includes many migrants. Some estimates suggest that almost 58% of the city's population consists of migrant workers from within Gujarat or other states.[80] Heavy migration in an urban context may lead to tensions within a city for affordable housing, need for systems, protections and infrastructure that is able to meet the basic demands of migrants.

The city had the reputation of being one of the filthiest cities in India but is now famous for its transformation to one of the cleanest cities in the country. In 1994, a flooding event led to the spread of the plague. While the spread of the plague was stopped within a week, it served as an inflection point in the city's history. It was a focus event that presented itself as a window of opportunity for accelerating systematic change in the way the city functioned.

These changes were largely attributed to a change in administration, which has since institutionalized several of the new initiatives. Therefore, Surat is often cited as a case study for effective municipal administration. Further, the role of collaboration in the form of civil society and citizen engagement is also often highlighted while studying its transformation.

Case Study - City Spotlight 4 - **Surat, Gujarat**

Public health management was transformed, strengthening the city's socio-economic resilience.

Prior to the reforms taken after the 1994 plague, Surat faced poor public health, with regular disease outbreaks and epidemics. According to some estimates, around 60% of the population fled the city and industry suffered huge losses to the tune of INR 12 billion.[81] The plague was a result of poor public health management, infrastructure, and sanitation. Surat was known to be a city 'floating on sewage water'. The plague broke out in the fringe areas of the city, which tend to have less sanitary conditions as compared to the rest of city. Often, the most marginalized communities, living in slums or informal settlements, are located at the outskirts of the city. These areas tend to have limited sanitation facilities, leaving residents more affected and vulnerable during crises like the plague.

Post 1995, major administrative reforms were made to public health infrastructure, public health surveillance, sanitation, and administration to improve health outcomes of the city.[82]

The Surat Municipal Corporation (SMC) initiated comprehensive administrative restructuring, moving from a rigid hierarchy to a decentralized, more interactive structure, delegating decision-making power and financial authority to zonal officers and increasing accountability through regular monitoring. Health infrastructure was vastly expanded, with urban health centers (UHCs) increasing from six in 1991 to 42 by 2014, and the Health Department strengthened with dedicated wings for disease control.[82]

Public health surveillance also significantly improved. A public health mapping exercise was undertaken in 1995, keeping in mind preventative and promotive health care. The SMC developed a network of 274 surveillance centers most of which are in slums.[81]

These, among a string of other measures, have had a major impact on positive health outcomes for the city. Health is an important aspect of socioeconomic resilience that helps an individual to remain resilient in the face of a health crisis. Thus, it is important to build strong, robust public health systems that remain resilient in the face of crises. While some of these measures were taken many decades ago, part of the learnings from Surat's resilience-building is the institutionalization of reforms that continue to shape the city's state of sanitation today.

Surat has built institutional resilience through administrative decentralization, financial autonomy, and a citizen-centric governance model.

Surat's institutional transformation began with a significant administrative overhaul following the 1994 plague, championed by then-City Commissioner S.R. Rao appointed in 1995.

The rigid, vertical hierarchy was transformed into a more interactive, horizontal structure. Decision-making was decentralized to six zones, which became "one-stop" service points for residents, thereby reducing the need for citizens to visit the central city hall. The SMC now has a virtual city hall that serves as a one stop shop for citizens to avail most services offered by the SMC. The transformed work culture included mandatory uniforms and obligatory field duty for SMC officials, fostering high staff commitment

While many ULBs in India suffer from a lack of financial autonomy, Surat has been able to improve its tax collection and rely on its own sources of revenue generation for its finances. It has been noted that Surat has robust financials with a strong tax collection system. Further, Surat has effectively levied user charges for its services such as water and sewage. The CRISIL ratings rationale further highlights its sound technical capabilities and supportive staff. Healthy finances help build financial independence for the municipality which allows it to spend on areas it deems important.

Case Study - City Spotlight 4 - **Surat, Gujarat**

This strengthens the corporation as an institution, which further strengthens other pillars of resistance.

Surat's transformation can be attributed to the strong institutional reforms that have been a result of strong leadership, political will and community support. While strong leadership and political will can directly initiate reforms, it has been observed in Surat that communities and civil society organizations played an important role in helping preserve institutional memory and strengthening institutional reform.

Surat's garbage collection is an example of strong infrastructural resilience.

An example of strengthened institutional resilience is Surat's transformation of its door-to-door garbage collection system. Prior to the plague, only around 40% of the city received regular door-to-door collection. Infamous for open drains and accumulated waste, especially in fringe areas, Surat's inadequate sanitation infrastructure significantly contributed to the rapid spread of the outbreak.

Some of the measures to improve solid waste management included mechanized night sweeping in the 1990s, with major roads now cleaned twice daily: by contractors at night and by Corporation sweepers during the day. A door-to-door garbage collection system, a decade ahead of the Swachh Bharat Mission, was introduced in 2004, initially by providing free dustbins and then evolving into direct household collection. Even during large-scale festivities, immediate cleaning is performed. The SMC also engaged in public-private partnerships (PPPs) for sanitary activities, contracting out garbage collection, road cleaning, and employing private sweepers, with the corporation and private contractors managing municipal solid waste in a 60:40 ratio. Stringent enforcement measures, including fines for littering and improper disposal, underscored the commitment to cleanliness.

Surat's Integrated Command and Control Centre monitors any hygiene violations and issues relevant fines. Further, the Center tracks that there are no open garbage piles, waterlogged drains etc. This is an example of the city leveraging technology to survey the proper discharge of its sanitation related services.[84]

This tech-enabled oversight exemplifies how institutional strength underpins resilient infrastructure: a capable authority builds an effective waste-collection system, which in turn enhances environmental resilience (by reducing flood and health risks) and socio-economic resilience (through improved living conditions and public health).

Even with several transformation in governance and institutions, Surat continues to navigate two key challenges: securing sustained financing for long-term resilience projects, and integrating a growing, often vulnerable, migrant population into its urban safety nets. Financial constraints despite strong revenue streams, limit the city's ability to fund initiatives beyond initial project cycles, while migrants arriving with insecure housing, low incomes, and limited awareness of services add complexity to equitable service delivery. Surat gives a clear set of learnings from its resilience journey.

Key Takeaways

1. Sustained funding enables long-term resilience:

Surat's ability to maintain reforms beyond initial interventions highlights the importance of embedding resilience efforts within regular municipal budgets and exploring diverse financing options.

2. Fiscal autonomy strengthens local decision-making:

The city's strong tax collection and user-charge systems allowed it to respond more swiftly to local needs. Financial independence emerged as a key enabler of institutional agility and targeted service delivery.

3. Migrant inclusion is important for equitable urban resilience:

With nearly 60% of its population being migrants, Surat illustrates the need for intentional integration through housing, health, and information services particularly in the early years of arrival, to reduce vulnerability and build social cohesion.

4. Crisis-driven reforms can leave a legacy:

The 1994 plague catalyzed deep institutional transformation in Surat. The city's experience shows how crisis moments, if met with bold leadership and community participation, can lead to systemic change in governance and infrastructure.

5. Resilience is most effective when pillars reinforce each other:

Surat's approach demonstrates how financial innovation, citizen engagement, and strong institutions can work in tandem towards strengthening infrastructure, improving health outcomes, and supporting vulnerable populations through a cohesive urban strategy.

Case Study

Case interventions:

Rejuvenation

The Challenge: confronting the erosion of urban natural ecosystems

India's urban transformation has come at an ecological cost. Rapid land-use change, infrastructure expansion, and demographic intensification have led to the systemic erosion of natural ecosystems—particularly lakes, wetlands, and green spaces. It has also increased exposure to climate hazards such as flooding, urban heat, and water insecurity. Within this context, rejuvenation has emerged as a critical strategy for building urban resilience. It is the process of restoring degraded urban ecosystems and re-integrating them into the spatial, civic, and institutional fabric of the city in the following ways:

- **Ecological restoration of the commons:** Often undertaken in cities where land-use change and pollution have decimated historical water bodies, these interventions seek to rebuild natural hydrological cycles, improve climate adaptation, and restore public access to green spaces.

  - A flagship urban transformation project, the Sabarmati Riverfront in Ahmedabad, combines flood protection, promenade creation, and urban landscaping.[85] While lauded for its design and economic spillovers, the project has also associated with relocation of riverside informal communities and shifts in traditional livelihoods.[86]

- **Community-based stewardship models:** These interventions emphasize local stewardship, often involving resident associations, community volunteers, or traditional user groups in the upkeep, governance, and ecological protection of restored wetlands or lakes.

  - Once a neglected water body, Jakkur Lake in Bengaluru now exemplifies community co-management. A decentralized treatment plant, regular monitoring by local groups, and biodiversity interventions have turned it into a thriving aquatic ecosystem. Community buy-in and institutional partnerships have helped it resist the cycles of neglect common in other city lakes.[87]

- **Civic and public realm reclamation:** In cities dominated by vehicle-centric planning, pedestrian-focused rejuvenation projects aim to reclaim streets and waterfronts as civic infrastructure. These interventions frequently balance aesthetic and mobility improvements with socio-political complexities, especially around access, gentrification, and displacement.

  - By pedestrianizing sections of the Dal Lakefront and Lal Chowk, Srinagar has improved walkability, opened visual access to natural assets, and created vibrant urban spaces.[88] At the same time, these changes have prompted conversations around the commercialization of urban space and the potential marginalization of informal economies and working-class users.

- **Tenure-sensitive green planning:** This archetype focuses on integrated habitat planning in slums and low-income settlements, where open spaces are often contested or absent. By linking tenure security with environmental improvement, such projects enable both material upgrades and social inclusion, treating slum dwellers as legitimate urban citizens entitled to public infrastructure and climate resilience. Tenure security provides a degree of confidence or protection to people staying on the land or in the home they occupy, reducing the likelihood of unexpected eviction or displacement.

  - India's largest urban land titling and slum redevelopment initiative, Jaga Mission provides tenure security to over 1 million slum dwellers while integrating green and blue infrastructure like parks, stormwater drains, and sanitation hubs into dense informal settlements.[90] The use of geospatial surveys, community participation, and policy convergence sets a precedent for inclusive urban rejuvenation.[91]

While these diverse approaches to rejuvenation offer promising models, questions remain around how they can be sustainably embedded within institutional systems. In some contexts, beautification and renewal efforts have altered the use and accessibility of public spaces, at times affecting informal livelihoods as observed in parts of Srinagar and Coimbatore. Many initiatives have emphasized flood control, with comparatively less emphasis on addressing other climate-related risks such as rising heat. In the absence of well-defined mechanisms for shared ownership and accountability, some restored spaces may face challenges related to long-term upkeep, equitable access, or ecological maintenance.

Coimbatore's lake rejuvenation project

Coimbatore, an industrial city in Tamil Nadu, has long struggled with the degradation of its water bodies. Kurichi Lake, spread across 330 acres, was emblematic of this crisis, suffering from severe pollution due to sewage inflow, rampant solid waste dumping, broken hydraulic structures, and recurring urban flooding.[92] The ecological decay was compounded by the city's rapid urbanization, where natural ecosystems were often overlooked in the process of expanding infrastructure.

This challenge, however, was not isolated

to Kurichi. Across Coimbatore, lakes had deteriorated into dumping grounds, losing their role as critical urban infrastructure for water management, biodiversity support, and climate regulation.[93]

In response, the Coimbatore Lake Rejuvenation Project was launched under the Smart Cities Mission in 2017. This was a city-wide initiative covering seven major lakes, including Kurichi. This program has demonstrated how institutional convergence, catalytic capital, and civic engagement can deliver durable ecological and social dividends. Its model offers valuable lessons for other Indian cities seeking to reframe environmental restoration as a pathway to inclusive, climate-resilient urbanism. The rejuvenation strategy in Coimbatore unfolded in the following way:

- **Environmental rejuvenation:** Constructed wetlands, reed beds, and sedimentation basins to filter sewage and stormwater naturally. Invasive species were removed, and native vegetation was restored.
- **Hydrological rehabilitation:** Damaged hydraulic structures were repaired, with new inflow and outflow systems designed to regulate water levels and mitigate flooding.
- **Public realm activation:** With support from private sector organizations like Oasis Designs and other partners, lakefronts were transformed into public spaces featuring walkways, cycling tracks, and amphitheaters.
- **Community participation:** Residents, civic groups, and students were actively engaged in planning, contributing to design choices and stewardship models.
- **Institutional collaboration**: The project mobilized municipal leadership, CSR funding from industries, technical expertise from CDD Society, and contributions from landscape architects.[94]

The Kurichi Lake plan specifically included converting 8% of the lake area into functional wetlands, creating 20 acres of green cover along bunds and bird islands, and developing public spaces to reconnect communities with the lake. The total cost was pegged at INR 49 crore.[95]

The Coimbatore case illustrates how resilience is a civic process—requiring the integration of ecological science, community voice, and institutional design.[96] The project's alignment with Climate Smart Cities Assessment Framework CSCAF indicators on water management, green cover, and biodiversity further reinforces its impact:

- **Ecological restoration:** Water quality has improved significantly, with enhanced oxygenation, reduced turbidity, and the return of migratory birds—an indicator of restored ecological function. Formerly eutrophic and weed-choked lakes now sustain aquatic biodiversity.
- **Urban heat and flood regulation:** The rejuvenated lakes have functioned as blue-green infrastructure, mitigating flood risk by absorbing monsoonal runoff and reducing urban heat through increased evapotranspiration and vegetation coverage.
- **Social cohesion and public health:** This project has transformed derelict water bodies into multi-use public spaces, featuring walkways, amphitheatres, and cycling tracks. It has also enhanced access to urban commons, supporting active mobility, and neighbourhood integration.
- **Tourism and local economic spillovers:** The revitalized lakefronts have emerged as urban attractors, extending tourist stays and stimulating local economic activity. Adjacent real estate markets have seen upward shifts, and small businesses have reported increases in foot traffic.[97]

The project has exemplified a multi-actor governance model, wherein municipal leadership, private capital, technical expertise, and civic engagement have been aligned to deliver on urban resilience goals.[98]

Key Takeaways

Urban nature can function as core infrastructure:

Coimbatore's experience shows that treating natural ecosystems like lakes and wetlands not as peripheral green assets but as core infrastructure can deliver climate, social, and economic dividends. Rejuvenated lakes helped regulate heat and flooding, while supporting biodiversity and public health.

Multi-actor collaboration enables durable outcomes:

The success of the lake rejuvenation initiative lay in its convergence model, which brought together municipal leadership, CSR funding, landscape designers, and community groups. This diverse coalition ensured both design quality and long-term ownership.

Embedding social access into ecological restoration strengthens equity:

By activating the lakefront as a public space with walkways, amphitheatres, and bird islands, the project emphasized inclusion alongside ecological outcomes. Such efforts helped foster civic pride and access to urban commons.

Stewardship mechanisms are essential for long-term impact:

The initiative underlined the importance of citizen engagement not just in planning but in ongoing stewardship through RWAs, civic platforms, and biodiversity committees to prevent future decline.

As climate disasters intensify and urban commons dwindle, Coimbatore's model, grounded in systemic thinking, cross-sectoral partnerships, and tangible outcomes, offers a blueprint for how Indian cities can reclaim their natural assets as foundations of resilience, equity, and livability.

Case Study

Case interventions:

Crisis Response

The Challenge: Learning from city-level COVID-19 response about urban resilience

Over the past decade, the escalating frequency and intensity of climate-induced, economic, or public health crises has normalized crisis response as a default intervention archetype in urban policy worldwide. When crises become overwhelming in scale and rapid in onset, they expose the profound misalignment between the complex, interdependent risks that shape urban life and the siloed, systems designed to manage them. In cities, where governance involves navigating competing demands and resource constraints, a crisis can further aggravate existing vulnerabilities. This was particularly visible during the COVID-19 pandemic, which made visible the underlying architecture of risk in India's cities.[99, 100]

The pandemic underscored how existing infrastructural and institutional gaps shaped urban vulnerability. In many dense informal settlements, limited access to water, sanitation, and shared facilities made social distancing especially challenging. Frontline workers like waste pickers and sanitation staff often operated without adequate safety measures or WASH provisions. The absence of comprehensive worker databases and rigid delivery mechanisms meant that many informal workers, who make up a significant share of the urban workforce, faced difficulties accessing relief, with widespread livelihood disruptions during the lockdown.

Case Study - Case interventions: **Crisis Response**

In parallel, public health systems were stretched thin, and civil society actors played a vital role in bridging service delivery gaps. Some primary healthcare centers, located in areas exposed to floods or extreme heat, revealed how climate considerations are not always integrated into infrastructure planning. In response, cities adapted, drawing on local partnerships, decentralized networks, and community-led innovations to meet urgent needs.

- **Decentralized coordination (Institutional Resilience):** Community unions and ward committees stepped in where formal hierarchies were stretched.
- **Pop-Up service infrastructure (Infrastructural Resilience):** Adaptive reuse of public spaces maintained essential health and shelter services.
- **Targeted socio-economic support (Social Resilience):** Cash transfers and food kits reached those facing challenges accessing conventional welfare schemes.
- **Emergency Environmental Safeguards (Environmental Resilience):** Makeshift WASH and waste-collection points protected public health and ecosystems.[100]

These responses, though temporary, offer critical insights for redesigning urban systems to better manage not just crises, but everyday risks that define life for millions in Indian cities.

1. Rajasthan's cash transfers and government coordination

In Jaipur and other cities of Rajasthan, unregistered domestic workers and informal laborers had limited formal channels to access relief schemes, leaving large sections of the urban workforce without immediate support when incomes were disrupted overnight. In a notable recognition of informal worker networks, the Rajasthan state labor department partnered with the Rajasthan Mahila Kaamgaar Union (RMKU).[101]

The union's deep ward-level presence enabled outreach to workers lacking contracts, proof of address, or employer references. In Jaipur alone, RMKU facilitated transfers to over 8,800 domestic workers, making it one of the few models in India to reach informal workers at city scale with transparency and dignity.[102] As Gautam Bhan reflected, this case illustrates how membership-based organizations can become "delivery infrastructure," especially when state systems collaborate meaningfully with the informal city.

Embedding relief delivery within trusted community networks, the program not only accelerated disbursement but also strengthened social cohesion, demonstrating that resilience depends on channeling official support through existing grassroots structures for faster, more legitimate crisis response.

2. Chennai's fever camps and civic mobilization

By mid-2020 when cases were surging, the Greater Chennai Corporation scaled up a localized response through decentralized fever camps. By late July, approximately 37,384 camps had been held, screening over 2 million residents, which is about 20% of the city's population.[103] These camps were executed at the ward level, averaging around 500–550 camps daily and staffed not only by municipal health teams but also by NGO volunteers assigned to residential blocks for door-to-door screening.[104]

Importantly, these fever camps continued beyond the acute phase of the pandemic. In March 2023, Tamil Nadu's health minister confirmed the continuation of over 1,000 weekly fever camps, aimed at early detection and management of influenza-like illnesses, which was a continuation of the screening camps set up during the lockdown.[105] This sustained integration of crisis response into routine services bridged formal and community health networks, boosting the city's capacity not just to absorb shocks but to transform its public-health infrastructure for ongoing disease surveillance.

3. Kochi's decentralized response to migrant laborers

During lockdown, an estimated 100,000 migrant "guest" workers in Kochi faced housing and food insecurity. The Ernakulam Municipal Corporation, in coordination with the district administration, panchayats, and Civil Society Organizations (CSOs), acted swiftly to address this crisis.

The authorities set up over 4603 relief camps across the city for the migrant workers, and another 35 camps opened for homeless and destitute populations.[106]

What made Kochi's response effective was the activation of decentralized city governance structures, mobilizing ward councilors, sanitation workers, and Kudumbashree volunteers at scale. The city's health outreach included the Bandhu Clinic, recognized by WHO as a best practice, which served over 15,000 vulnerable migrant workers in its first year. [107]

As Dr. Vikasben noted in interviews, "Cities can do good work when empowered, but we must preserve this institutional memory for future crises." This exemplary work has revealed that resilience thrives when cities decentralize authority and embed crisis response in local institutions.

The COVID-19 pandemic surfaced new delivery models, trust networks, and civic collaborations that may not have emerged under routine governance. Cities worked alongside unions, youth groups, panchayats, and civil society, and even repurposed public infrastructure to meet urgent needs. As the crisis recedes, the real challenge lies in embedding these adaptive strategies into long-term urban policy.

Key Takeaways

Empowering ward-level governance:

The experiences of Kochi and Chennai demonstrate how ward actors with clear mandates and resources can enable more responsive and equitable relief. Cities can build on this by institutionalizing crisis-response roles at the ward level with dedicated budgets and protocols.

Mainstreaming emergency infrastructure:

Adapting emergency infrastructure into routine services turns temporary assets into lasting value. Cities can integrate protocols for pop-up clinics, shelters or testing centres into their standard operating procedures, ensuring these facilities remain ready and relevant beyond the crisis.

Extending social protection through partnerships:

Partnering with worker unions or cooperatives like Rajasthan's domestic-worker cash transfers, extends social protection to informal workers. Cities facing registry gaps can similarly engage local associations as official delivery partners for targeted social-protection programs to reach overlooked populations.

Pre-Identifying emergency infrastructure:

Creating a ready-to-go inventory of potential emergency sites like schools, community halls, open grounds and other public facilities ensures cities can cut response time. Such preparedness enables cities to activate facilities quickly, without conducting surveys mid-crisis.

As these cases demonstrate, collaboration, data, and local knowledge are critical tools in making urban systems more inclusive and resilient. The imperative is to carry forward the learnings from COVID-19 not just to respond better to future shocks, but to strengthen cities' everyday systems to serve those most at risk.

Case Study

Case interventions:

Community Collaboration

The Challenge: Unlocking community participation through collaborative interventions

Urban vulnerability in India is a product of multiple, interlocking systems that often leave certain populations more exposed to risk. As climate shocks intensify, informal settlements expand, and public systems strain under demographic pressures, reimagining urban resilience as a socio-political and institutional project, anchored in participatory governance, spatial equity and dignity` becomes imperative.[108] At the heart of this reframing is the role of community-based interventions: models that recognize residents as active co-creators of resilient urban systems. To effectively ameliorate systemic urban vulnerabilities, resilience must be predicated not only on technical systems but also on community-embedded collaboration. Across India, public agencies, civil society organizations, and grassroots formations are co-creating models that center lived experience, intersectional equity, and localized governance. These can be conceptualized into four archetypes:

Case Study - Case interventions: **Community Collaboration**

- **Embedded cohort models:** These interventions deploy trained professionals or community leaders within municipal bodies to catalyze participatory governance and accountability.
  - At IIHS, the Urban Fellows Program embeds analysts within state and non-state institutions to co-develop plans and nurture civic capacity.[109]
  - Similarly, SEWA Bharat commissions local women leaders to mediate between informal workers and statutory authorities, ensuring that social entitlements reach the grassroots.[109]
- **Participatory governance mechanisms:** Mechanisms grounded in the 74th Constitution Amendment —such as ward committees—are proliferating through civil society activation.[12]
  - Janwani's interventions in Pune catalyzed a rise in participatory budget inputs from 600 (2012–13) to 3,300 (2013–14), with municipal participatory budgeting allocations jumping from INR 26.2 to INR 36.9 crore.[110] It has also enabled Zero-Garbage models in slum areas, serving over 125,000 families with ISO certification for pilot wards.[111]
  - In Surat and Indore, ward-level consultations have become instrumental in co-designing sanitation and solid waste services.
  - Bhubaneswar's leap in the Swachh Survekshan rankings is largely attributable to slum-dweller associations and local committees institutionalizing community feedback and local monitoring.
- **Localized planning and community participation:** Cities like Delhi and Bhopal have piloted spatial planning frameworks that incorporate informal settlements into urban master plans. In building forums to engage with perspectives of marginalized residents, such approaches are leveraging legal advocacy to reframe informality.
  - In Mysore, slum residents have organized community centers to facilitate access to social entitlements and livelihood supports, promoting informal collective identity through platform engagement. [112]
  - The Ahmedabad Slum Networking Program once facilitated tenure security through participatory infrastructure upgrades; although now discontinued, its central premise remains salient.[113]
- **Community-led climate-infrastructure integration:** These interventions co-create infrastructure responses to climate vulnerabilities through participatory spatial planning and WASH governance.
  - The Centre for Advocacy and Research's (CFAR) Water for Women initiative in Jaipur and Bhubaneswar spans 215 informal settlements and has enabled community monitoring via 'Saniclimi' walls; data-driven interventions resulted in 44 previously unserved households in Bhubaneswar and allocation of sewerage systems in Jaipur—all mediated through ward-level community committees.[114]
  - The Chennai Climate Action Plan leveraged GIS-based flood mapping and on-ground validation to influence metropolitan planning, enabling targeted interventions.[115]
  - In Chintamani, Karnataka, small-city planners are integrating collaborative climate action into legally mandated Master Plans, signaling a shift from reactive to anticipatory resilience.[116]

While these archetypes exemplify diverse modalities of collaboration, the challenge lies in sustained institutional embedding. Officer-initiated models—such as Delhi's Bhagidari Commission or Mumbai's Advanced Locality Management—have delivered early-stage innovation but faced limitations in the absence of long-term legal and fiscal integration. Certain sectoral efforts, like Karnataka's SOP-driven legacy waste management and cluster-

based procurement models for smaller municipalities, demonstrate how local experimentation can inform state-wide policy frameworks.[117, 118, 119]

CFAR's WASH Program

From 2018 to 2024, CFAR implemented a multi-city intervention aimed at transforming WASH governance into informal urban settlements. The program specifically prioritized groups historically excluded from urban planning—transgender individuals, persons with disabilities (PwDs), single women, adolescent girls, and the elderly—through targeted needs assessments, leadership development, and representation in multi-stakeholder forums.[120] Following challenges persisted, further aggravating the vulnerabilities of said communities:

- **Infrastructure deficits:** Many settlements lacked access to water pipelines or sewage networks. Over 50% of informal settlements in Jaipur, for instance, remained disconnected from formal sewage systems, raising public health concerns.[121]
- **Social exclusion:** Marginalized groups, especially transgender individuals and PwDs, encountered discrimination and often faced challenges in accessing public WASH facilities due to limited inclusive design such as the lack of gender-neutral toilets and universally accessible infrastructure.
- **Climate vulnerability:** The rise in extreme weather events—cyclones, floods, and droughts—exacerbated existing fragilities in WASH systems. Informal settlements, lacking drainage and climate-resilient infrastructure, were disproportionately affected.
- **Governance gaps:** While policy frameworks reflect an intent to include informal settlements, on-ground integration into formal planning processes remains a work in progress. This is often shaped by limited disaggregated data, the absence of consistent participatory platforms, and varying levels of civic engagement capacity.

Crucially, CFAR adopted an entitlement-focused yet community-owned methodology, shifting the role of marginalized populations from passive recipients to active participants in co-designing and monitoring WASH services. It played a key role by establishing community-led governance mechanisms such as Community Management Committees (CMC), Single Window Forums (SWF), and Multi-Stakeholder Forums (MSF), strengthening participatory decision-making and service delivery. CFAR responded, urgently and effectively with a focus on building sustainable and resilient solutions. Over a span of seven years (2018 to 2024), these efforts have collectively reached more than 393,000 individuals living primarily in informal and formal settlements across municipal wards and cities, aligning with the goals of inclusive and climate-resilient urban WASH governance.

- **Community structures:** CFAR established multi-stakeholder committees that convened residents, municipal officials, health workers, and gender advocates to co-create solutions. These platforms enabled a bottom-up articulation of needs, while embedding accountability into local governance.
- **Capacity building:** Through intensive training and legal-literacy efforts, the program equipped community leaders—many from marginalized identities—with the tools to negotiate policy, monitor services, and influence planning decisions. Findings from the field show that the CFAR program demonstrates a strong alignment with the government's urban development agenda by integrating climate-resilient WASH infrastructure and enabling inclusive practices in informal settlements of Bhubaneswar and Jaipur.

Case Study - Case interventions: **Community Collaboration**

- **Systemic integration:** The program worked within existing policy frameworks, ensuring that innovations could be scaled and sustained through government systems rather than parallel NGO-led delivery.

- **Climate resilience:** The initiative emphasized long-term planning—integrating early-warning systems, decentralized infrastructure (such as community-managed toilets), and maintenance protocols adapted to extreme weather scenarios. CFAR program has worked to develop climate proof infrastructure mostly against threat of floods, cyclones; on developing a pool of resource persons who understand the implications of weather forecasting; and linkage of the community to disaster preparedness plans of the local government.

However, while the program has made significant strides, areas such as heatwave preparedness and localized loss-and-damage mechanisms remain under-addressed. Strengthening financial and institutional frameworks could support a more comprehensive approach to resilience – one that extends beyond service delivery to engage with deeper structural vulnerabilities. The CFAR program illustrates how co-governance can help shift urban resilience from a primarily state-led infrastructure approach towards a more participatory civic practice.

Strengthening financial and institutional frameworks could support a more comprehensive approach to resilience – one that extends beyond service delivery to engage with deeper structural vulnerabilities.

Key Takeaways

Participatory frameworks gain traction when embedded in urban policy:

Community engagement has proven more sustainable when integrated into larger missions such as Smart Cities, AMRUT 2.0, and state climate adaptation plans through formal mechanisms like ward-level institutions, participatory planning mandates, and inclusive performance indicators.

Civic infrastructure and capacity influence the success of collaboration:

ULBs that have been able to work effectively with community actors often invested in internal capabilities such as facilitation training, dedicated liaison staff, and access to discretionary or flexible funding pools.

Transparency and disaggregated data improve accountability in service delivery:

Cities that employed real-time dashboards, open-source WASH mapping, and data disaggregated by gender, age, and ability were better positioned to identify gaps and course-correct in collaboration with citizens.

The long-term resilience of India's cities is closely linked to evolving models of governance that enable deeper collaboration between communities and institutions. When residents are engaged in the design, monitoring, and upkeep of urban systems, resilience efforts are more likely to be grounded, inclusive, and durable. The archetypes presented here, along with examples such as CFAR's multi-stakeholder committees, offer valuable insights into how community collaboration can be meaningfully integrated into urban planning processes.

Case Study

Case interventions:

Capacity Building

The Challenge: Supporting and strengthening institutional capacity for action

India's cities are increasingly embracing the notion that resilience must be built through empowered institutions, recognizing the dependence on officials and institutional bodies who understand, implement, and maintain such measures. The growing urgency around resilience has, at times, led to a reliance on short-term or ad hoc capacity-building efforts. In some cases, international organizations have supported developing countries through standalone training sessions and workshops, which may offer limited long-term impact with short-term benefits and effects.

Three interlocking challenges illuminate the institutional fragilities in India's urban landscape:

- **Limited technical and operational capacity:** Many ULBs especially in tier-2 and tier-3 cities, are still developing the technical expertise required for climate-responsive planning, financial engineering, and integrated project management.
- **Financing constraints:** Limited access to stable, long-term financing—including credit markets, climate bonds, and resilient budget structures—can make it difficult for cities to pursue and sustain transformative investments.
- **Complex governance ecosystems:** The presence of multiple departments with overlapping mandates and limited coordination can hinder integrating resilience into day-to-day urban planning and delivery.

"I think the capacity of our cities to be able to continue being the economic growth engine, as well as the cultural center, despite facing climate induced shocks; I think that's what resilience really means to us. And when I say capacity, it means all kinds of capacities of a city. It means that you have adequate people to do it, people with the right capacities to think through it, the data in place, the finances, and the systems. What it really means to be a resilient city is that you have all of this together."

– Meghna Malhotra, Urban Management Centre

Reframing the response: institutionalizing resilience as governance competence

Across India, a new generation of institutional interventions is emerging—designed not merely to deliver projects but to rewire governance systems for resilience. This requires embedding resilience into the DNA of institutions through three interconnected strategies:

- **Embedding resilience-building within existing mechanisms:** To ensure continuity beyond specific projects or leadership tenures, resilience-building efforts need to increasingly be anchored within established processes and routines of local governance.
  - Assam provides a strong example, where under the State Institute of Rural Development, Faecal Sludge and Septage Management (FSSM) training has been institutionalized.[122] Every new municipal engineer and Panchayat Raj functionary receives structured courses on sanitation resilience, ensuring a consistent knowledge base across turn-over cycles.
- **Peer-networks for institutional knowledge:** Peer learning through city partnerships enables municipal leaders to exchange practical knowledge, build mutual confidence, and accelerate the adoption of resilience strategies by witnessing solutions in action.
  - Partnerships such as ICLEI's CapaCITIES and the Global Platform for Sustainable Cities provide officials with exposure to tested interventions across areas like climate-smart infrastructure, financial planning, and inclusive urban design.[123, 124]
  - Under the Nurturing Neighborhoods Challenge, Rourkela hosted peer officials from the grant-winning ten Indian cities, facilitating on-site learning and behavior change strategies that emphasized replicability and cross-learning.[125]

Streamlining financial capacity-building: Institutional capacity is closely linked to financial autonomy. When cities face limitations in accessing credit, capital markets, or green finance instruments, it can hinder their ability to translate climate plans into actionable investments.[126]

- PCMC has demonstrated how institutional preparedness can unlock green finance. In June 2025, the city issued an INR 200 crore green municipal bond, India's first dedicated to sustainable mobility, at a 7.85 percent coupon. The issue was oversubscribed 5.13 times, drawing INR 513 crore in bids and qualifying for an INR 20 crore central grant. By strengthening creditworthiness, financial transparency, and debt capacity, PCMC turned fiscal readiness into climate investment.

Case Example: PCMC climate finance transformation

Pune became one of the first Indian cities to set up a dedicated Sustainability Cell to serve as an inter-departmental hub; bringing together finance, urban planning, engineering, environment, and transport teams. Faced with escalating challenges and risks, the municipality recognized that traditional revenue streams and siloed governance models were insufficient.

Pimpri Chinchwad's rapid urbanization has brought with it a familiar set of challenges: rising emissions, car-centric sprawl, overburdened infrastructure, and growing exposure to climate risks. Yet, like many Indian cities, it has faced structural constraints in financing sustainable solutions at scale. Traditional municipal budgets have been stretched thin, and climate-focused investments may not always receive the institutional support or financial mechanisms required for sustained implementation.

Against this backdrop, in June of 2025, PCMC became the first municipal corporation in Maharashtra, and one of the earliest in India, to issue an INR 200 crore green municipal bond aimed at funding sustainable mobility projects, specifically the "Harit Setu" non-motorized transport corridor and Telco Road redevelopment.[127, 128] This achievement was not just financial innovation; it was the outcome of concerted institutional reforms designed to support climate-resilient urban development.

Today, the Cell runs regular capacity-building sessions and workshops for departmental staff, creating a shared language around resilience and climate goals.[129] Its mandate includes integrating sustainability criteria into project appraisals, developing monitoring frameworks, and tracking progress across departments.[130] This equips individual departments to incorporate climate considerations into core operations and planning frameworks. Some of the enabling features include:

- **Fiscal strengthening:** Achieving AA+ credit ratings (CRISIL, CARE) through debt transparency, sound fiscal management, and accountability systems.
- **Financial innovation:** Structuring India's first municipal green bond for sustainable mobility, listing on the Bombay Stock Exchange, and aligning with international green finance standards.
- **Governance reform:** Establishing the Sustainability Cell to drive cross-departmental project appraisal, climate budget formulation, and monitoring.
- **Operational modernization:** Adopting a Climate Budget Guidebook, training multiple municipal departments, and linking with IMD for disaster data integration.
- **Knowledge networks:** Drawing from ICLEI, CapaCITIES, and peer cities to benchmark, adapt, and institutionalize best practices in climate-responsive urban finance.

This layered model reflects the need for a wider shift: where resilience is no longer an add-on, but a core competency embedded in systems, budgets, and minds. By weaving training, finance, collaboration, and legal design together, India is laying the foundations for cities that are not only climate-ready, but institutionally equipped to evolve and endure. The PCMC example underscores a critical pivot: from viewing resilience as a project-based outcome to embedding it as an institutional function.

Key Takeaways

Financial credibility:

The AA+ bond issue demonstrated that robust fiscal systems enable climate financing even in smaller cities.

Legal institutionalization:

Creating a climate budget and formalizing disaster data sharing embedded resilience into operational norms.

Collaborative governance:

A coordinated cell ensured that departments worked in concert, accelerating project readiness.

Design for scalability:

PCMC's approach provides a template, combining credibility, planning, and coordination; suited for other tier-2 or tier-3 Indian cities.

With enabling policies, technical training, and cross-sector platforms, PCMC exemplifies how building institutional capacity can translate resilience from policy intent into action that is financed, managed, and monitored on the ground.

Case Study

Interview

Philanthropy in Action: The Danis on powering Mumbai's civic renewal

Project Mumbai, a nonprofit founded in 2018 by Sanjay Panwalkar and Shishir Joshi, empowers communities across the Mumbai Metropolitan Region (MMR) through a Public-Private-People partnership model, addressing challenges like clean water, mental health, food security, accessibility, inclusivity, and environmental sustainability. The organization engages citizens, businesses, and government entities to create scalable solutions for a more inclusive, resilient city. Their impactful initiatives, such as providing mental health support in prisons, beach clean-up drives, enhancing accessibility for persons with disability, training citizens in fire safety, interactive sessions on organ donations, have touched the lives of over 1.6 crore people.[131] With 160+ partnerships and 100+ successful campaigns, Project Mumbai has made significant strides in improving the life of marginalized communities.[132]

In this context, we spoke to Jalaj and Vita Dani – long-time champions of Project Mumbai to understand their approach towards philanthropy and the role funders can play in shaping the future of Indian cities.

Q: What inspired you to support Project Mumbai, and was there a moment or idea that resonated with you?

Jalaj: For philanthropy to matter, it must reflect your values. Gandhi said India lives in its villages, but today, it also lives in its cities – where opportunity and crisis converge. Civic services like sanitation, mobility, and health shape daily life, yet often go unnoticed. We have long supported rural development in Kapadvanj. Mumbai lacked a unifying civic voice to connect government, citizens, and civil society. That's what sparked Project Mumbai – a platform to bring these actors together. We saw Brihanmumbai Municipal Corporation (BMC) as a key systems player and trusted in collaborative leadership, having worked with Shishir earlier. Our goal wasn't just to fund projects, but to build a citizen-led ecosystem. Volunteering is core – when people give their time, not just money, they build ownership. We want Mumbai to be the "kindness capital of India," where civic participation is part of everyday culture.

Vita: When COVID hit, Project Mumbai was just 18 months old. But we quickly set up control rooms, distributed supplies, and vaccinated the most vulnerable. The spirit of "Mumbai ke liye, kuch bhi karega" (we'll do anything for Mumbai) became our

ethos – urgency and compassion became our DNA.

Q: What distinguishes your model of collaborative, volunteer-driven philanthropy and what's your call to action for other philanthropists looking to invest in cities?

Jalaj: For us, it's not about being hands-on or hands-off – it's about being present. We stay committed through what we call "engaging conversations" – offering NGOs strategic inputs, access to subject matter experts, and capacity-building support. This not only strengthens their work but also builds our conviction when representing them to the government or other funders.

Urban India urgently needs support. While every philanthropist should follow their heart, our cities need more "Project Mumbais" – platforms built on shared ownership and sustained collaboration. As funders, we can help weave together the people, institutions, and ideas that make that possible.

Q: How do you choose which causes or organizations to support?

Jalaj: Our philanthropy is both focused and personal. Project Mumbai was born out of a clear civic gap we identified in the city. In Kapadvanj, my hometown, we support maternal health, education, livelihoods, and heritage restoration. In sports, we're building a full pipeline – nurturing grassroots talent and supporting athletes all the way to podium finishes – through leagues, coaching, and infrastructure. We also partner with institutions like Pratham for their strong governance and national footprint and invest in animal welfare near Mumbai.

Vita: Our guiding principle is simple: do a few things well, sustainably, and collaboratively. Philanthropy should be voluntary, and values driven. While every cause matters, it's important to focus on what excites you and where you can commit for the long haul with an eye on social, environmental, and governance impact.

Q: What have you learned from your NGO partners about building trust and long-term impact?

Vita: Trust takes time. You have to say what you do and do what you say. In Kapadvanj, we saw firsthand how far a single rupee can go. We also realized that the government is the largest player in social impact. Donors can't replace the state, but we can help make public systems more effective. Philanthropy works best when it complements government efforts – by bringing in expertise, improving delivery, or reducing inefficiencies. When done right, every rupee contributed can unlock 10, 20, or even 100 times more value by amplifying what's already in motion. That's the true power of collaborative philanthropy.

Q: What were some of the challenges, surprises, and proud moments in your work with Mumbai on urban issues?

Jalaj: In philanthropy, if you're not chasing personal visibility such as your logo on every banner, you can achieve far more. Partners may question your motives, so it's important to stay focused on solving their problems. That's when doors begin to open. Urban challenges are deep-rooted; they didn't emerge overnight. It takes patience and staying power. Officers get transferred, ministers change, elections happen – you must be ready to rebuild trust and momentum, again and again.

One key learning has been the power of open platforms. When your work is seen as larger than any one person, NGO, or department, it builds trust and helps endure political or bureaucratic shifts. We've also learned to start small; bite-sized wins build credibility. Once people trust your intent and delivery, you can scale across wards, departments, even ministries.

Case Study - **Interview**

Vita: I'll add just this: "If you want to go fast, go alone. If you want to go far, go together." Collaboration is everything. It's better to strengthen what's already working than to start from scratch. Local partnerships help you connect with people on the ground. Even when people differ in approach, they often share the same goal.

Q: What role should funders play in shaping the future of Indian cities, and what advice would you offer to those investing in urban rejuvenation?

Jalaj: A good starting point for funders is civic services – roads, sanitation, public parks, which affect citizens every day. Education and healthcare are equally vital, and in all these domains, credible NGOs can serve as essential intermediaries. Beyond basic services, urban India needs support in areas like garbage collection, road design, park upkeep, and rainwater harvesting for lakes, ponds, and beaches. While many local initiatives exist, they often hinge on the energy of a few individuals. What's missing is a scalable framework and sustainable delivery model.

Often, the physical infrastructure is available – what's lacking are the softer skills: administration, fundraising, and execution. Take sports as an example. We don't always need new stadiums; what's needed is investment in coaching, sports science, and athlete support systems. Government bodies face constraints owing to procurement rules or limited capacity. Philanthropists can fill these gaps by focusing on quality and flexibility, where the state cannot. By complementing public systems with expertise and catalytic capital, funders can dramatically enhance the effectiveness and reach of existing infrastructure.

Q: What does resilience mean to you in the urban context, and how do you envision resilient Indian cities?

Jalaj: Resilience is about preparedness. Our cities weren't designed for today's population pressures. We need bold thinking, data-driven design, and faster clearances — all anchored in long-term urban planning. Many systemic gaps can be closed through deeper collaboration with the government.

Vita: Resilience also means designing for well-being. Parks and open spaces build community, improve health, and foster human connection. We need cities that prioritize children and people, not just cars or commerce.

Case Study

Organization Spotlight 1: BORDA

www.borda.org/vereinsorgane/

Organization Overview
Founded: 1977 | Head Office: Bremen, Germany | Coverage: Karnataka, Kerala, Himachal Pradesh and Ladakh

Leadership:
Snehit Prakash, Regional Director | Aseem Acharya, Director Program

About

Bremen Overseas Research and Development Association (BORDA) is a German non-profit organization working globally to enable climate-sensitive and inclusive WASH and Waste Management Solutions, particularly in small and medium towns. Since 2001, BORDA has been diligently working towards improving the WASH and Waste Management Ecosystem within India, through sustainable infrastructure planning and service enhancement with water resource conservation, total water cycle care and resource recovery, integrating ecological health and socio-economic concerns while facilitating policies and standards.

In 2020, BORDA helped Leh clear 80,000 tonnes of legacy waste and reclaim 20 acres, creating a model for mountain-town waste management. Today, it works with 20 small and mid-sized towns in Ladakh, Karnataka and Kerala alongside implementation partners FISH, TIDE and LEDeG. As a collaboration champion, BORDA co-launched NIUA's 2022 Parvat Manthan forum and sits on India's National Fecal and Septage Management Alliance (with Gates Foundation) and the ClimateRISE Alliance (with Rainmatter Foundation). A 25-member Indian team of engineers, planners and facilitators, backed by international experts, executes its tailored projects.

Figure 1: Legacy waste site in Leh. Before & After

Legacy waste, an estimated 1.3 billion tonnes across 3,000+ dumpsites in India—poses mounting risks for small and medium-level towns. BORDA is clearing 400,000 MT of legacy waste in eight partner towns, including 80,000 MT and 20 reclaimed acres in Leh. Current efforts span six towns in Chikkaballapur, reducing emissions, preventing contamination, and recovering resources.

Case Study - Organization Spotlight 1: **BORDA**

Inclusive and climate sensitive WASH in Small towns

Small towns with a population under 100,000 face the brunt of climate change despite minimal contributions to the crisis. Recognizing this, BORDA is advancing the Inclusive Climate Sensitive WASH (ICS-WASH) framework, a decision-making tool to help ULBs design and implement climate-resilient WASH systems. This framework empowers towns with strategies, tools, and capacities to anticipate and address climate-induced vulnerabilities while ensuring inclusive service delivery. BORDA aims to bring focused attention to the needs of small towns within broader climate initiatives. Through this initiative, BORDA is building local leadership and enabling evidence-based planning to safeguard essential WASH services. BORDA, supported by CMC Chintamani is also piloting a Climate Sensitive WASH Action Plan for Chintamani, the first of its kind in India for towns with population below one Lakh.

Pourakarmika Virama Kendra

BORDA also launched the Pourakarmikara Virama Kendra guiding document in 2025, with the Government of Karnataka, which marks a critical step towards professional dignity of sanitation workers in Karnataka.

BORDA, using the model of Virama Kendra, reimagines safe, inclusive, and dignified work facilities for sanitation workers where they could rest, clean up, store machines & tools, and feel valued as professionals. Drawing from this realization, BORDA partnered with ULBs of Leh (UT of Ladakh), Chikkaballapura, Chintamani & Sidlaghatta (Karnataka), to design and construct the first set of Virama Kendras. These facilities went beyond structures and were designed with principles of access, ease of use, gender inclusivity, safety etc. They offer toilets, bathing areas, changing rooms, resting space, and secure storage, right within or near municipal work zones. Presently, around 3,000 sanitation workers and their family members are being benefitted from these facilities. BORDA has supported Karnatak Government in developing toolkit for scaling up Paurakarmikara Virama kendra across 198 ULBs of Karnataka.

DEWATS and FSM

Over the past 25 years, BORDA has successfully implemented approximately 300 decentralized wastewater treatment systems (DEWATS) in India. BORDA implemented India's first Faecal Sludge Treatment Plant (FSTP) in Devanahalli, Karnataka (2015) and India's first Public-Private Partnership (PPP) model for Faecal Sludge Management in Leh, Ladakh (2017). These initiatives – developed with partners such as BMZ, BMGF, CDD Society, and LEDeG – have significantly informed India's formal FSM ecosystem.

Case Study

Organization Spotlight 2: Urban Management Centre

www.home.umcasia.org/

Organization Overview
Founded: 1997 | Head Office: Ahmedabad | Coverage: Pan India, Odisha, Gujarat, Assam, Maharashtra, Tamil Nadu, Telangana, Andhra Pradesh, among others

Leadership:
Manvita Baradi, Founder & Director | Meghna Malhotra, Deputy Director

About

The Urban Management Centre (UMC) is a women-led, India-based non-profit organization that has worked for over 25 years to build resilient, inclusive, and well-governed urban systems. With a mission to "make cities work for everyone," UMC combines technical expertise, governance reform, and community-driven approaches to address complex urban challenges. It operates across more than 13 Indian states and engages at all levels of governance—from community to national—helping design and implement solutions in WASH, urban livelihoods, climate resilience, infrastructure, and capacity building.

Program Focus

- **Enhancing Livelihoods of Urban Workers through Socio-economic Resilience City Livelihood Action Plan (C-LAP) Framework:** UMC developed and piloted the C-LAP framework in partnership with MoHUA to equip ULBs with a structured approach to livelihood planning for the urban poor.[133] Implemented in cities across Gujarat and Odisha, C-LAP includes data-driven diagnostics, participatory assessments, and city-specific action plans tailored to economic sectors and vulnerable populations. Since 2017, It has catalyzed the formation of 10,000+ SHGs of sanitation and waste workers nationally.[133] The framework ensures that informal workers, women, and other marginalized groups are systematically included in economic recovery planning.

- **Garima Scheme (Odisha):** Launched by the Odisha government in 2020, the Garima Scheme is India's first comprehensive initiative to safeguard the dignity, health, and welfare of sanitation workers.[134] UMC served as the technical partner, designing standard operating procedures, worker training modules, enumeration tools, and rest centers (Garima Grihas). Over 15,000 sanitation workers have been formally identified and are being linked to entitlements, and more than 200 were certified as trained Sewer Entry Professionals.[135] Garima's success directly influenced Tamil Nadu's Sanitation Workers Development Scheme (SWDS) and contributed to the national rollout of the NAMASTE scheme, setting a new standard for occupational safety in urban sanitation.

These initiatives target some of the most vulnerable segments of India's urban workforce—sanitation workers, informal vendors, and self-employed women—who often lack social protection. By improving income security, formalizing work, and connecting people to welfare and safety nets, UMC's programs support systemic poverty alleviation and long-term economic resilience, particularly in rapidly urbanizing but underserved areas.

Case Study - Organization Spotlight 1:

- **Enhancing Urban Infrastructure and Climate Action for Environmental Resilience**

MISAAL Program: Implemented in four cities—Ahmedabad, Jodhpur, Porbandar, and Sambalpur—MISAAL supports sustained Open Defecation Free (ODF) status through WASH service delivery in slums. With USAID support, UMC led the sanitation mapping of 30,000 households across 223 informal settlements, capturing spatial and behavioral data to improve infrastructure, awareness, and monitoring. The initiative led to a 10% increase in water access, 7% rise in sanitation coverage, and a reduction in open defecation from 26% to 19%.[135] The use of tools like the "Sanitation Mapping Tool" and "MISAAL Settlement Committees" enabled participatory problem-solving at the community level.[136]

Chennai Climate Action Plan (CCAP): UMC co-developed the CCAP with the Greater Chennai Corporation and C40 Cities to align the city's infrastructure planning with carbon neutrality goals by 2070.[135] By integrating GIS-based flood risk mapping, cross-sectoral stakeholder engagement, and climate data into Chennai's Third Master Plan, the CCAP now serves as a national reference for mainstreaming climate action in city planning. It is also being adapted for Guwahati. UMC's efforts ensure that city-level plans are both mitigation- and adaptation-ready, with a clear focus on vulnerable populations and essential services.

From wastewater to climate shocks, UMC's programs embed sustainability at the service delivery level. By linking climate risks to service delivery failures (e.g., poor drainage, unsafe toilets), these initiatives help cities proactively plan for resilience, especially where slums and vulnerable communities are disproportionately affected by environmental degradation.

- **Digitizing Sanitation Worker Safety for Infrastructural Resilience**

UMC's Cuneiform: UMC developed the Beneficiary Management System based on its Cuneiform portal in partnership with the Government of Odisha and Tamil Nadu. The tool was originally adapted to enumerate sanitation

workers and has since been extended to include waste pickers in both urban and rural areas, identifying and validating nearly 190,000 individuals to ensure they receive proper recognition and access to social security benefits.[135] It features error-checking algorithms, geo-tagging, and worker-centric dashboards. By increasing visibility and improving data accuracy, Cuneiform has helped streamline the rollout of sanitation welfare schemes under Odisha's Garima and Tamil Nadu's SWDS and NAMASTE, and has informed national-level discussions on formalizing sanitation labor.

UMC's infrastructure-related programs go beyond hardware; they digitize and institutionalize safety nets for frontline workers who maintain urban sanitation systems. This strengthens not only physical infrastructure but also the service ecosystem and accountability mechanisms around it—critical for resilient urban operations.

- **Building Professional Networks and Governance through Institutional Resilience**

City Managers' Associations (CMAs): UMC initiated the CMA movement in India, beginning in Gujarat, to professionalize and connect local government officials. By 2007, CMAs had spread to 13 states, reaching over 1,800 ULBs—representing 65% of India's urban population. UMC provided technical mentorship, peer learning opportunities, and exposure visits, facilitating better city-level governance and decision-making.[135] This movement has since been replicated demonstrating how localized institutional models can inspire broader regional reform.

UMC's institution-building work promotes long-term, self-sustaining governance. CMAs and related efforts create professional networks and technical capacities that outlast individual projects, embedding resilience at the organizational level and fostering cross-city learning.

Case Study

Organization Spotlight 3: Shelter Associates

www.shelter-associates.org

Organization Overview
Founded: 1994 | Head Office: Pune | Coverage: Maharashtra, Tamil Nadu, Uttar Pradesh

Leadership:
Pratima Joshi, Founder & Secretary

About

Shelter Associates (SA) is a Pune-based non-profit that has worked for three decades to transform urban informal settlements through data-driven, community-centered solutions. Recognized for pioneering digital tools and GIS mapping in slums, SA empowers local governments and underserved communities to co-create sustainable outcomes in sanitation, housing, waste management, and health. SA's approach combines ground-level engagement with scalable technical innovation, particularly targeting the dignity, safety, and inclusion of urban poor households—especially women and children.

Tackling Social and Health inequality to build Socio-economic Resilience

One Home One Toilet (OHOT): This flagship program facilitates the construction of individual household toilets in urban slums, addressing gaps in public sanitation infrastructure. By enabling families to co-invest in toilet construction and providing them with design support, SA fosters ownership and permanent behavior change around sanitation. The initiative has directly impacted over 200,000 people across seven cities in Maharashtra and has seen measurable results, such as a 19% drop in urinary tract infections (UTIs) among women and improved school attendance among girls.[137] OHOT also enhances dignity, reduces public defecation, and contributes to better health outcomes for entire communities.

Digital Addressing: SA equips slum households with Google Plus Codes, converting informal locations into digitally verifiable addresses. This innovation has enabled over 125,000 families to access banking, welfare schemes, insurance, and formal jobs. By making households "visible" to service delivery systems, digital addressing enhances residents' access to protections, benefits, and mobility.[137] The program also fosters economic stability and dignity, and has strengthened participation in urban governance by allowing residents to engage more directly with municipal authorities.

Menstrual Hygiene Program: This addresses the issue of period poverty and promotes sustainable practices by educating women and adolescent girls about menstrual health and eco-friendly sanitary alternatives like menstrual cups and cloth pads.[138] By educating communities on the harmful impacts of disposable sanitary products, the program reduces environmental waste and promotes healthier alternatives. It also challenges the stigma surrounding menstruation, fostering gender equality and improved reproductive health awareness in marginalized communities.

Together, these programs confront entrenched social and health inequalities that impact urban poor communities,

especially women. Whether improving physical health through sanitation and menstrual care or fostering access to services via digital addresses, SA's work builds foundational resilience in underserved populations and strengthens their ability to participate fully in urban life.[138]

Improving Waste Management Practice to build Environmental Resilience

Solid Waste Management: This program involves slum communities in source segregation, safe disposal, and promoting behavioral change regarding waste. Through street plays, workshops, and participatory tools, SA encourages responsible waste habits and collaborates with ULBs to enhance infrastructure such as bins, drains, and collection routes. GIS data assists in tracking coverage and identifying gaps, ensuring ongoing improvement. The program lowers environmental pollution and health risks, particularly in areas where open dumping and blocked drains present serious sanitation threats.

By improving waste practices and creating spatial accountability, SA reduces the environmental burden on already vulnerable communities. This not only improves living conditions but also strengthens the urban ecosystem's overall resilience to climate-related challenges such as flooding and disease spread.

Promoting Inclusive Housing Solutions for Enhanced Infrastructural Resilience

Housing (Slum Redevelopment / Beneficiary Led Housing): Shelter Associates supports community-driven housing projects that prioritize tenure security, proximity to livelihoods, and social cohesion. By including families in the design and location process, SA ensures that housing solutions are livelihood-sensitive and promote long-term upward mobility. Projects in Pune, Sangli-Miraj, and Kolhapur have provided secure homes to over 9,000 individuals, improving educational and emotional outcomes for children and providing residents with legal addresses and access to utilities.[137]

Access to safe, legally recognized housing provides the foundation for improved health, education, and economic participation. SA's model shifts slum upgrading from a top-down relocation approach to a community-driven, in-situ improvement strategy, making infrastructural resilience more durable and inclusive.

Digital Solution for Responsive Governance through Institutional Resilience

Data (GIS Mapping / Household Surveys / Data System for ULBs): SA has pioneered the use of GIS technology and detailed household surveys to create dynamic slum data layers for cities. These datasets help ULBs identify service gaps, plan infrastructure, and track progress in sanitation, housing, and health. Importantly, SA trains slum communities to conduct and interpret these surveys, building local capacity and ensuring data is not just extracted but co-created. This model has been used to inform policy making and service planning across several Indian cities.[137]

Reliable, disaggregated, and community-validated data are essential for accountable and responsive governance. SA's work equips ULBs to plan effectively and empowers communities to advocate for their needs, creating durable, citizen-state relationships and improving urban planning outcomes in low-resource settings.

Chapter 7

Plausible Futures: Recommendations & Analysis

What kind of urban future feels worth working toward? How might India's cities grow in ways that are inclusive, adaptive, and prepared for compounding risks? And what would it take — across policies, technologies, and partnerships to move in that direction? At the same time, which structural, financial, and institutional constraints continue to weigh cities down?

This chapter offers a way to think through these questions by surfacing cross-sectoral insights and recommendations for building more resilient and inclusive urban futures in India. Drawing on field learnings, interviews, and urban planning approaches, the ideas presented here aim to be both visionary and actionable — especially when pursued through shared purpose and collaboration.

Navigating urban transformation with the futures triangle framework

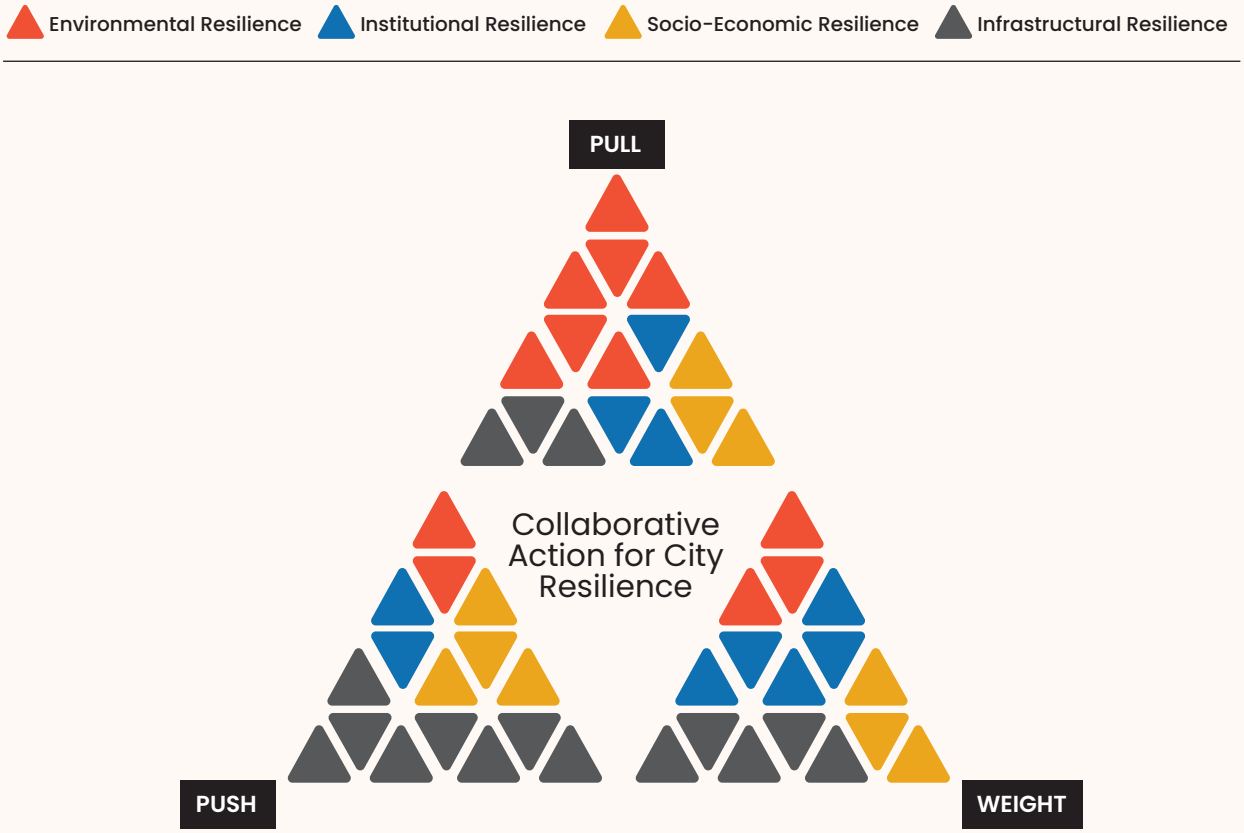
Leveraging futures thinking into urban planning can help provide strategic foresight to build transformative and responsive solutions for building resilient cities. Therefore, for synthesizing recommendations across different stakeholders the report has used the Futures Triangle as an analytical tool to understand how the aspirations of the future interact with the drivers of the present and the inertia of the past. In the pointers below, we have provided a brief explanation of the three concurrent forces, applied in the context of Indian cities:

- **The Pull of the Future** represents the common aspiration and motivations that can build hope and set precedents. In the Indian context, stakeholders are committed to building resilient cities that are inclusive, environmentally regenerative, socially protected, and governed by participatory, accountable institutions.

- **The Push of the Present** represents trends, patterns, and tangible drivers that are occurring in the present, while simultaneously creating futures. In the Indian context, the current policy shifts focusing on environmental priorities, social protection, and infrastructure investments are accelerating change with high growth patterns amidst persistent inequalities.

- **The Weight of the Past** represents structural barriers that create resistance to achieving the potential of the future. In the Indian context, inadequate rising urban pollution levels, unplanned growth, and high population density competing with the provisioning of basic services within cities continue impeding progress.

Figure 7: An Analysis to Understand Plausible Urban Futures in India



PULL OF THE FUTURE: EVOLVING DEMANDS

- Participatory governance + data-centric decisions
- Social protection and inclusion for city residents
- Sustainable infrastructure and pedestrian culture
- Environmental balance with disaster preparedness

PUSH OF THE PRESENT: INFRASTRUCTURE GROWTH

- Smart cities and boost for digitalization
- Housing, micro-entrepreneurship and ration
- Focus on infrastructure and beautification
- Disaster risk reduction and climate action plans

WEIGHT OF THE PAST: DEVELOPMENT NEEDS

- Devolution of power and resources to ULBs
- High population density and overcrowding
- Unplanned growth and construction
- Urban pollution and waste management

The Futures Triangle helps glean foresight on plausible futures for resilient city in the Indian context. We learnt that while past may have been focused heavily on the development needs of newly formed country, the present is addressing the infrastructure growth amidst rapid urbanization. However, the future holds evolving demands in a country where the majority will soon be urbanized. In this milieu — actionable solutions will emerge from collaborative action across four interconnected pillars: socio-economic resilience, infrastructural resilience, institutional resilience, and environmental resilience.

A resilient city of the future must have social protections for the urban poor. A resilient city of the future must protect and nurture their natural environment. A resilient city of the future must have strong institutions that provide stable and participatory governance. A resilient city of the future must have sustainable and inclusive infrastructure. In the sections below, we will cover how the Futures Triangle foresees recommendations across each of the four pillars, and stakeholder groups.

Socio-economic **Resilience**

Socio-economic resilience

- **Weight of the Past:** In the past, the lack of effective access amidst high population has placed a strain on implementation of policy priorities and government programs.
- **Push of the Present:** The present has seen a thrust of programs such as One Nation One Ration Card, and Housing for All (PMAY). This is contributing to alleviating existing vulnerabilities.
- **Pull of the Future:** The future demands a paradigm shift that centers social protection in all interventions. Social protection measures must prioritize the equity, safety and wellbeing of its citizens.

What can socio-economic resilience in cities look like?

- A city that accounts for the various vulnerabilities of all its inhabitants (urban poor, migrants, informal workers, and other marginal groups), and provides inclusive social protections and facilitates slum rehabilitation, ensuring housing for all.
- A city that recognizes the importance of livelihoods. In this context, recognizing the role of vendors in the informal economy as indispensable and taking measures to integrate them into city planning, rather than evicting vendors as a solution.
- A city that prioritizes education and healthcare, by providing adequate provisions for quality school education in the digital age, facilities for preventive measures, and emergency response.

City councilors and philanthropy actors can invest in the socio-economic resilience of individuals and communities, to help them withstand the shocks and harms.

City Councilors

Map vulnerability at ward level:

- Collaboration with local NGOs to update the ward's vulnerability map could help guide budget decisions. Amend by-laws to increase representation of women or informal workers, and add "socio-economic resilience" as a regular agenda item.[140]
- Demanding periodic assessments of housing stock, health access, sanitation capacity, and education outcomes in the ward will help in linking budget allocation to these assessments.

Philanthropy

Support innovative service delivery:

- Philanthropy can support innovative solutions by leveraging data and technology, such as digital platforms for interventions supporting domestic workers' or slum dwellers' access to sanitation facilities, etc.
- It could facilitate interactive platforms for vulnerability mapping (e.g., migrant data registries, slum service audits) and co-create PPP models with municipal bodies for integrated welfare delivery.

Infrastructural **Resilience**

- **Weight of the Past:** Indian cities have been encumbered by unplanned growth, fragmented transit systems, poor last-mile connectivity, and waste management failures.
- **Push of the Present:** There is a thrust on beautification, accompanied by significant investment in transit systems and modernist construction. Rising congestion and aggravating air quality are also concerning.
- **Pull of the Future:** Building resilience needs focus on local capacity, governance reforms that enable multi-actor coordination, and financing mechanisms that prioritize equity and livability.[141, 142]

What should resilient infrastructure in cities look like?

- A city whose infrastructure is designed for human-centred living, climate resilience, and sustainability and prioritizes walkable neighbourhoods, accessible public spaces, and reliable, low-emission public transport systems.
- A city that embraces sustainable mobility—integrating metros, electric buses, cycle tracks, pedestrian-friendly streets, and last-mile connectivity—to reduce congestion, lower emissions, and improve quality of life.
- A city that prioritizes circular, sustainable, resource-efficient infrastructure systems, with robust waste management, sanitation, drainage, and water systems that are decentralized, climate-smart, and community-responsive.

Governments must embed resilience into building codes, urban planning, and financing frameworks, while enabling cross-sectoral partnerships linking engineering, climate adaptation, and social protection.

City Councilors

Enable circular and sustainable solutions:

- Setting up ward-level infrastructure committees that include engineers, environmental experts, and citizen representatives to evaluate all new road, market, and housing projects against a concise resilience checklist covering drainage capacity, heat mitigation, and waste handling could help embed sustainable solutions in plan.
- Collaborating with stakeholders will allow setting up decentralised composting and greywater recycling in a neighbourhood, allocating ward resources for both installation and ongoing monitoring.

Philanthropy

Invest in underserved causes:

- Funding capacity-building for smaller cities to support community-led waste management models, enabling tech-driven waste solutions, and invest in research and demonstration projects for climate-resilient sanitation systems will provide support where most is needed.
- Prioritizing underfunded causes and coalitions that bring together diverse cohorts: frontline laborers, local governments, and service providers to design citywide welfare frameworks.

Institutional **Resilience**

- **Weight of the Past:** Only recent reforms recognized cities as constituencies. The political economy in the past lacked an imagination of the urban, comprising of centralized planning.
- **Push of the Present:** The present is defined by progressive policy pushes in the direction of digitalization and "Smart Cities." Such initiatives are improving access, transparency, and accountability.
- **Pull of the Future:** The future calls upon democratized information, making citizens stewards of their data. Participatory processes may enable future-ready governance, that is decentralized and informed.

What should institutional resilience in cities look like?

- A city that strengthens municipal institutions through devolved authority, skilled staffing, and well-defined mandates, recognizing empowered local bodies as essential for inclusive and responsive governance.
- A city that demonstrates robust institutional systems for transparent decision-making, inter-departmental coordination, and participatory planning, backed by data platforms that track institutional performance and service delivery outcomes for disaster mitigation, public health, housing, and mobility among others.
- A city that moves beyond the narrow technical definition of ULBs as service delivery agencies towards empowering them as custodians of resilience—responsible for social welfare, climate action, and inclusive governance.

Cities must leverage devolution of authority, fiscal autonomy, and participatory, transparent institutions through empowered local governments.

City Councilors

Build local fiscal autonomy with innovation:

- Prioritizing proactive and diversified financial strategies that leverage innovative financial instruments (such as municipal bonds and green bonds), coupled with strategic, cross-sectoral allocation of funds and robust multi-stakeholder partnerships will effectively build long-term, equitable urban resilience for all citizens.
- Account for relationships with residents' welfare associations, informal worker collectives, NGOs, and academic institutions to co-create ward-level resilience plans.

Philanthropy

Invest in municipal capacity strengthening

- Consider funding platforms that facilitate open data, budget transparency, and collaborative governance. Support intermediaries that bridge government and civil society, fostering participatory budgeting, neighborhood assemblies, and citizen-led audit processes.
- Funding technical assistance for ULB finance teams to develop ward-level budget-planningtools. Pool resources to make "bigger bets" on critical, systemic issues that require substantial investment. For example, steps towards ending manual scavenging or driving larger behavioral change agenda of Swachh Bharat.

Environmental **Resilience**

- **Weight of the Past:** Liquid and solid waste management and urban pollution have been persistent concerns. Grey infrastructure development was viewed as a trade-off with environmental protection.
- **Push of the Present:** There is a shrinking of green cover, rising pollution and destruction of natural protections.[143] But most state governments have climate action plans and rejuvenation of water bodies.[144]
- **Pull of the Future:** Cities of the future may witness disproportionate impacts of disaster. There may also be a need for greater balance with circular economies and integrated nature-based solutions.

What should a resilient environment in cities look like?

- A city that recognizes and safeguards its natural ecosystems through an integrated approach to planning, enabling restoration and rejuvenation of affected resources, protecting green belts and urban biodiversity.
- A city that looks beyond investment in grey infrastructure and intentionally prioritizes nature-based solutions, recognizing their multiple co-benefits beyond environmental protection.
- A city that uses robust, transparent, and community-accessible environmental data systems to monitor air quality, track heat islands, map water stress, and guide timely, equitable action to protect both people and ecosystems.

Cities must integrate nature-based solutions as part of their urban planning and design to protect the natural environment, as well as build resilience towards climate and natural disasters.

City Councilors

- City councilors could consider advocating for an integrated approach to planning for the preservation and strengthening of the natural environment through cross departmental teams/cell (e.g. Pune's sustainability cell)
- Institutionalizing cross-departmental green infrastructure taskforces could preserve urban commons. Allocate a ward fund (e.g. 3–5 %) for community-led pilots in green infrastructure with simple reporting on ecological and social outcomes.

Philanthropy

- Philanthropists could consider supporting technical capacity building of smaller cities that have resource constraints so that these cities can integrate use of data in creating heat and climate action plans. For e.g. BORDA supporting the climate action plan for Chikmaglur and not the nearby Bengaluru has helped the city.
- Prioritizing funding ecological restoration and climate action projects in peri-urban areas to build resilience.

The Foundational Practices for Collaborative Action

Beyond the four detailed pillars of city resilience, our analysis identifies three overarching practices for collaborative action. Unifying effort – these practice promise unlocking a comprehensive view of urban resilience.

1.

Institutionalize resilience reviews:

Every proposal from a new toilet block to a road realignment—carries an explicit, two-line statement on how it reduces risk, promotes equity, and supports long-term resilience. This transforms ad-hoc pilots into standard operating procedure, so vulnerability data and community priorities are woven into every decision up front.

ULB Administration

- Update project-approval forms to include a "resilience notes" field
- Orient planning and engineering teams to reference ward vulnerability maps and equity criteria

Private sector

- Apply the same brief screening when suggesting or funding infrastructure and service projects
- Share design and construction plans early so public data can inform the resilience note

Community & CBOs

- Host or support local mapping exercises each quarter to keep risk profiles current
- Offer feedback on draft resilience notes to ensure they reflect lived experience

2.

Create a unified accountability mechanism:

Rather than tracking social services, environmental health, and infrastructure separately, all performance indicators—complaints, budgets, project updates, survey results—feed data into a single, public dashboard. This makes it easy to spot gaps, compare progress across wards, and close feedback loops transparently.

ULB Administration

- Pull data from existing complaint systems, MIS platforms, and budget records into one interface
- Assign a data-manager and enable AI integration to oversee dashboard updates and troubleshoot access issues

Private sector

- Contribute outcome data (for example, tree-survival rates or waste-recycling volumes) from CSR or PPP projects
- Support dashboard maintenance or training as part of sustainability commitments

Community & CBOs

- Validate dashboard entries through periodic community surveys or spot-checks
- Use the dashboard to track service requests and follow up with local officials

3.

Secure permanent commons stewardship:

Common resources must be treated as ever-present assets. Through regular mapping, legal safeguard measures, and joint oversight, these shared spaces remain healthy, accessible, and resilient over time.

ULB Administration

- Maintain and publish an up-to-date GIS layer of all commons; require a stewardship plan for any intervention
- Allocate a small recurring budget line for routine maintenance and community-led upkeep

Private sector

- Embed commons care into CSR activities—such as sponsoring tree-planting drives or waste-management support
- Provide in-kind resources (tools, materials, expertise) for community maintenance events

Community & CBOs

- Organize regular site visits, clean-ups, and maintenance days
- Serve on ward-level stewardship committees to advise on local needs and safeguards

Whether funding a housing initiative, developing infrastructure, or creating a climate action plan, the question must always be: How does this strengthen the long-term capacity of the city as a system? This question can help in translating this foresight into actionable governance, equitable infrastructure, restored natural systems, and social protections that leave no one behind.
Every stakeholder—whether government officials, philanthropy, civil society, private industry, or citizens—holds a piece of this complex puzzle.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Chapter 8

Our Vision: The Way Forward

"Building resilient cities isn't just about catching up with backlogs or today's problems—it's about planning backwards from a clear long-term vision. We must define where we want India to be in 20 or 30 years and strengthen our city-systems accordingly. If the goal is a developed India, the route to it is unmistakably through empowered and resilient cities."

– Santosh Nargund, Janaagraha

Across the Global South, and increasingly in India, the city has emerged as a stage for our most urgent challenges and our most ambitious aspirations. India's urban journey is unfolding at a scale and speed unprecedented in modern history. This transformation signals a fundamental reordering of how and where social development must be negotiated, tested, and—if we are committed enough—secured.

The resilience-building movement now taking root in India's cities offers a compelling foundation for this developmental reimagination. Resilience, in this context, is about redesigning cities as places that can absorb shocks, adapt to change, and still nurture progress. It means envisioning cities where public infrastructure, climate preparedness, waste systems, and social protections are not siloed pursuits but interconnected levers for dignity, equity, and well-being.

At Dasra, we've witnessed firsthand how working on sanitation or waste management, or climate risk awareness, can open doors to a broader, place-based conversation about equity, climate, and governance. These become entry points into larger questions about how urban societies function, for whom, and at what cost. And yet, India's cities sit at a complex crossroads. They are magnets for opportunity and ambition, but also mirrors that reflect the fractures of inequality, exclusion, and institutional fragility. Recognizing this reality, we are envisioning platforms that bring local councilors and other stakeholders together, as the fulcrum of urban transformation. We believe that building urban resilience in India requires empowering these frontline leaders with the tools, networks, and narratives. Three interlocking approaches that can help catalyze change are:

- **Narrative building for city resilience:** Change begins with imagination. We aim to craft a national narrative that frames resilience not merely as risk management but as a blueprint for sustainable, equitable urban futures.

- **Fostering multi-stakeholder platforms:** Cities cannot be transformed by governments alone. We want to create platforms for municipal councillors, urban planners, philanthropists, civil society leaders, academics, and the community to learn and innovate.

- **Building institutional capacities for local action:** We want to strengthen the capacities of municipal institutions and enable councilors and city officials to engage with real-world scenarios, co-create solutions, and identify adaptable models suited to their local contexts.

The challenges ahead are formidable. But within this complexity lies immense possibility. Cities, by their very nature, are places of improvisation, intersection, and innovation. They are where diverse lives collide, where ideas ferment, and where progress can take tangible, collective form.

The ambition before us is not modest. It is to transform cities from sites of compounding risk into engines of shared resilience. To craft urban systems that are not only resistant to the shocks of tomorrow, but also generative—nurturing economic opportunity, social mobility, cultural dynamism, and a deep sense of belonging.

At its core, this is an ethical proposition as much as a technical one. It demands that resilience no longer be treated as an exercise in disaster response but as a civic responsibility—a commitment to designing cities that serve the complex, dynamic realities of the many, not the few.

In doing so, we are future proofing the engines of creativity, cooperation, and change that have always propelled humanity forward. Cities, at their best, are where people come together to solve what no individual, no village, no nation can solve alone. The work now is to ensure that they remain just that: places of possibility, dignity, and flourishing.

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Annexure 1 – A Summary of Key City Resilience Frameworks

Framework	Relevant Stakeholders	Application	Definition of a Resilient City
City Resilience Framework – 2024 (Resilient Cities Network)	Municipal bodies, urban planners, CBOs, disaster authorities	Strategic planning, investment, and project-level implementation at various scales	A city that uses a collaborative, cross-sectoral approach to address health, economy, environment, and governance; focuses on adaptability, regeneration, and thriving
City Resilience Framework (Rockefeller Foundation & Arup)	CROs, researchers, international organizations, resilience strategists	Strategic understanding of resilience qualities; foundation for other tools (like CRI)	A city that can survive, adapt, and thrive amid shocks and stresses; resilience as a function of interdependent systems
Resilient Cities Index (Economist Impact)	Policymakers, global analysts, financial institutions, donor agencies	Comparative analysis and benchmarking of cities; supports policy design and risk assessment	A city that is prepared for, can withstand, and recover from stresses; assessed across infrastructure, socio-institutional dynamics, economy, and environment
City-Systems Strategy (Janaagraha)	Indian municipal officials, governance reformers, civic tech groups	Diagnostic tool for city governance reform and capacity-building	A city with strong governance, empowered leadership, effective planning, financial health, and citizen participation; tackles root vulnerabilities

Annexure 1 - A Summary of Key City Resilience Frameworks

Focus	Indicators / Goals	Level of Application	Unique Features
Practical and user-friendly for cities, neighborhoods, precincts; encourages participation and cross-sector action	22 goals (refined from earlier 56 indicators); tailored through local consultation	Scalable – city, neighborhood, or precinct level	Updated for modern risks; promotes shared language and integrated collaboration
Research-based, with systemic focus; foundation for global resilience thinking	12 goals, 56 indicators, and 7 resilience qualities; qualitative and quantitative mix	City-wide, with adaptability for context	Strong academic foundation; first to define and measure urban resilience in a structured way
Benchmarking-driven; evaluates preparedness, adaptability, and recovery across 25 cities	Multiple quantitative indicators and sub-indicators across 4 pillars; transparent scoring	City-wide, globally comparable; not intended for direct city rankings	Highly data-driven; connects resilience with climate, sustainability, infrastructure
Reform-focused; strengthens institutions and promotes citizen engagement	Indicators on governance, finance, planning, and participation	Primarily for Indian cities, supports reform and diagnostics	Focused on democratic reform; merges policy, advocacy, and grassroots action

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