



Image courtesy: go.itdp.org

PUNE

RESILIENCE

STRATEGY

PIONEERED BY THE
ROCKEFELLER FOUNDATION

100 RESILIENT CITIES





MUKTA TILAK
Hon. Mayor of Pune

Pune, one of the most progressive cities in India, has played a significant role in pioneering urban planning. It is known for its active citizen participation in the city's growth. The city has transformed over the years, from an education hub to an auto industries hub, and now an IT hub. This has resulted in migration, increase in population and expansion of city limits. In the future, the city is expected to expand further with addition of 23 surrounding villages and will probably become the largest city of Maharashtra in terms of size.

Like other Indian cities, Pune faces many challenges such as uncontrolled growth, continuous migration, pressure on urban environment, institutional complexity, etc. The city administration tries to resolve these issues with the use of technology, capital works, internal resources, and the organization's internal capabilities. Sustainability and resilience are two key concepts that need to be built in for holistic development. The 100 Resilient Cities Network is supporting Pune city in building resilience.

It is an honour for Pune city to become part of the global 100 cities under 100 Resilient Cities (100RC), pioneered by the Rockefeller Foundation, selected through a stringent process and filtering numerous applications received from cities worldwide. This is one more step for Pune city to become a global city and an opportunity to guide other Indian cities to follow in its footsteps.

The resilience strategy process should focus on three key areas considering the current pattern of development and the future growth of the city. These three areas are - need for improvement in urban mobility, focus on urban environment including water body management, and preservation of biodiversity; and identify ways to improve employment opportunities and skills especially in the informal sector. The informal sector plays a very important role in the city's overall economy and will be given access to various services in an affordable manner.

Citizen involvement is very crucial in the resilience building process in these areas. The strategy should emphasize on citizen engagement and developing Information Education and Communication strategies to effectively implement various actions. This will help in achieving the city's vision of citizens involved and supported resilient growth.



SAURABH RAO, IAS
Pune Municipal Commissioner

One of the finest cities in Maharashtra, Pune has witnessed significant rapid growth over the last decade. Pune City envisions becoming one of the most liveable cities in India by solving core infrastructure issues in a 'future-proof' manner, and by making neighbourhoods clean, green, and beautiful

The character of the city transformed over the decades with its economic, demographic and social development. The 'Oxford of the East', 'Cultural Capital of Maharashtra', 'Auto Hub', 'IT hub' and now 'Smart City' has the potential to become 'Model Resilient City' of India.

To achieve this, it is important to integrate and mainstream the Resilience-building into city services, plans, and initiatives. Thus, the partnership with 100 Resilient Cities (100RC), pioneered by the Rockefeller Foundation, has happened at an opportune time. In this partnership, Pune Municipal Corporation (PMC) has shown its commitment by appointing Chief Resilience Officer (CRO) and setting up CRO's office to steer the strategy formulation process.

Fundamental to 100RC's philosophy on resilience is preparing cities for disasters but also, working with different socio-economic groups and a wide range of stakeholders to prepare for economic, social, and physical stresses and shocks. Now we have completed the Preliminary Resilience Assessment (PRA) Report and are moving ahead to Phase 2 of Strategy formulation. The scale and depth of stakeholder engagement that has gone into the PRA is very enriching.

The key Discovery Areas identified under PRA are a clear reflection of the challenges that lay ahead of the city and the need for future strategies to drive aligned actions and reforms. The CRO's office has got excellent support from the PMC, other government agencies, and local ecosystem including civic agencies, NGOs, individual experts and educational/research organizations during the PRA stage. This has helped in coming out with a comprehensive and detailed PRA document.

In Phase 2, the CRO's team will deep dive into three Discovery Areas through extensive consultations with various stakeholders and assessment of the city's needs. PMC will ensure its full support to the CRO's team in Phase 2.

Pune is slowly becoming a global hub by attracting and collaborating with many international agencies including foundations, donor agencies, and industry bodies, thus bringing in the best know-how to the city and facilitating them to set up pilot projects.

The Resilience Strategy will not only guide Pune city in streamlining and strengthening its plans and actions but also help in strengthening its position as a global hub. Pune has potential to become a Lighthouse City in resilience building in India and can encourage other cities to follow it.



MICHAEL BERKOWITZ
President, 100 Resilient Cities

On behalf of the 100 Resilient Cities organization, I'd like to offer my sincerest congratulations to the City of Pune, Municipal Commissioner, Mr. Saurabh Rao, I.A.S, Joint Secretary MoHUA and Former Municipal Commissioner, Mr. Kunal Kumar, I.A.S, Honorable Mayor of Pune, Ms. Mukta Tilak, and Chief Resilience Officer Mahesh Harhare on the release of the city's first ever urban Resilience Strategy.

This strategy takes a clear-eyed look at Pune's most pressing and complex challenges, including uncontrolled growth, inward migration, un- and under-employment among youth, and a degraded urban environment. Pune has a reputation as the 'Oxford of the East' and it has long built upon its academic tradition to ensure prosperity. But even Pune – with academia built into its foundations, with access to a young, well-educated talent pool, with a favourable reputation for business and industry – even Pune must adapt and innovate to ensure its growth doesn't get the better of it and to ensure its future is as illustrious as its past.

With a focus on Growth, Economy and the Environment, this strategy seeks to draw on all of Pune's resources to transform the city into a green, equitable and livable city for every resident. Two projects in particular highlight this ambition. First, Pune participated in the Resilience Accelerator program in partnership with Columbia University; consulting with every environmental group in the city to design an alternative vision for the Mula-Mutha River. This vision will ensure that the river once again serves the city not only as a source of clean water but also as a gathering space and green refuge from the heat of the city. Second, Pune's work on its innovative Pune Skills World project, which will show the city where its strengths and weakness are and will serve as a roadmap for ensuring that every citizen is valued for his or her contribution to Pune's economy.

What sets this strategy apart from other plans the city has compiled is the level of community and stakeholder engagement undertaken to develop meaningful solutions. Pune's CRO Mahesh Harhare and his team worked tirelessly to act as a bridge between local government, citizen forums, civil society, NGOs, and industry to ensure that every voice is represented in Pune's resilience building efforts. It is this dialogue that will give this strategy a successful start and it is only by continuing to work openly and collaboratively that these actions will come to life. As Pune takes on this challenging work, I encourage you all to continue to collaborate to build a more resilient Pune.



MAHESH HARHARE
Pune Chief Resilience Officer (CRO)

Physical, economic and social challenges have become an integral part of urbanization. Cities are grappling with shocks such as flooding, droughts among others, and stresses like traffic chaos, water shortage, pollution of water bodies, etc. The 100 Resilient Cities (100RC), pioneered by the Rockefeller Foundation identifies these shocks and stresses as critical challenges and aims to make cities more resilient. The 100RC will provide support to 100 select cities across the world, including Pune, to develop a holistic Resilience Strategy that reflects each city's distinct needs. Further, the 100RC platform will provide opportunities for Pune to connect with its global peers to share knowledge and best practices.

Pune has a unique position in Maharashtra due to its cultural heritage, educational progress, and industrial development. Availability of skilled work force, entrepreneurship, and abundance of water sources are major drivers for the development of the city. Pune city is known for its development-focused initiatives and reform-oriented approach to serve citizens better.

However, increasing population, rapid peri urban growth, and the expansion of city limits are creating complex challenges. There is no single solution to address these growing issues. There is a need for strengthening the sustainability concept and building resilience aspects in policies, plans, and actions. Therefore, the Resilience Strategy process, supported by 100RC, will be an important activity for Pune city to do a self-examination of its plans and assimilate the resilience concept.

Resilience building is a continuous process and needs people involvement. The Preliminary Resilience Assessment (PRA) work, which was carried out in Phase 1, involved extensive consultations with different experts and scanned through various plans and programs of the city. The Phase 2 work of strategy preparation will try to achieve this through promotion of people engagement. The strategy does not involve merely adaptive measures, but also transformative actions, for both the short and long term.

Pune city is becoming more global. The kind of interest that is being developed in international agencies and institutes for collaboration with Pune to explore, share, and create pilot projects is remarkable. This partnership with 100RC gives a platform to Pune to demonstrate its capabilities and explore potential for scaling new heights at a global level. As the CRO, my role is to focus on these aspects, deliver a holistic Resilience Strategy for Pune, and further support the city in implementation of pilot projects.

Pune Resilience Team

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100 Resilient Cities

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EXECUTIVE SUMMARY

Image courtesy: Sanjay Deshpande

Rapid urbanization in Pune has meant that structural inequalities and systemic vulnerabilities of individuals, institutions, ecosystems, and city development processes have surfaced; necessitating strategic engagement to make city-systems more resilient.

With the motivation to address these challenges, Pune was selected in 2016 to join the 100 Resilient Cities (100RC) Network, pioneered by the Rockefeller Foundation. Fundamental to 100RC's philosophy on resilience is not only preparing cities for disasters but also, working with different socio-economic groups and a wide range of stakeholders to prepare for economic, social, and physical stresses and shocks.

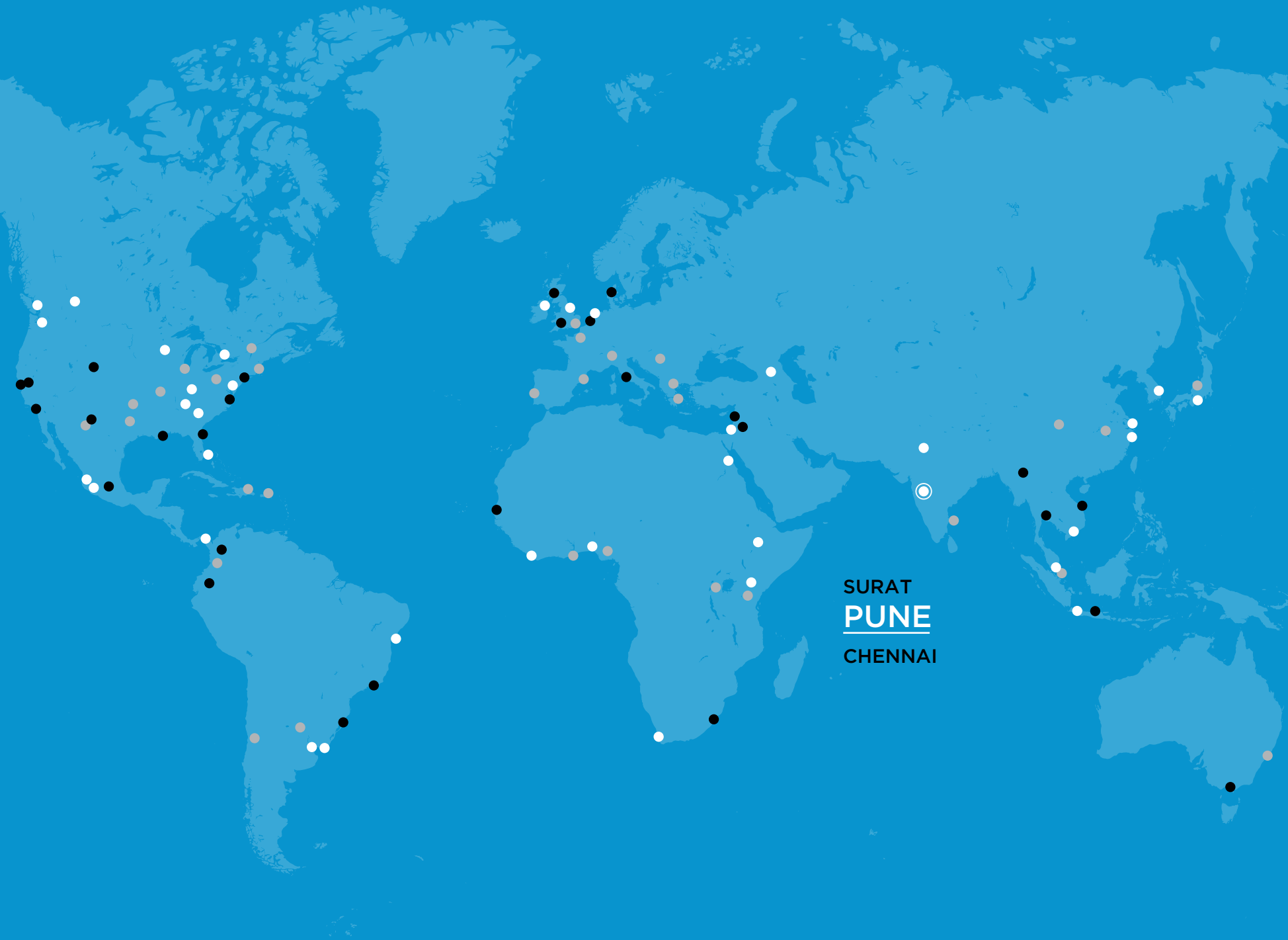
According to 100RC, “resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kind of chronic stresses and acute shocks they experience.”

Challenges within a city are framed as shocks and stresses

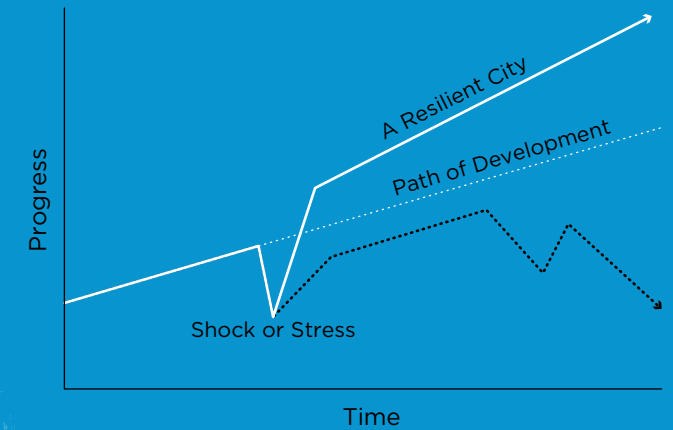
ACUTE SHOCKS are sudden, sharp events that threaten a city
 CHRONIC STRESSES weaken the fabric of a city on a day-to-day or cyclical basis

Figure 1: World map showing 100RC member cities

● ROUND ONE CITIES ● ROUND TWO CITIES ● ROUND THREE CITIES



A resilient city can bounce back faster and forward from shocks and stresses.



100RC provided four types of support to Pune, as its member city, in creating the Resilient Pune Strategy:

- 1 Two-year funding for a Chief Resilience Officer (CRO) and guidance to set up an Office of Resilience within the city government.
- 2 Funding for Strategy Partner (SP) to support the CRO and the city to develop a Resilience Strategy.
- 3 Access to Platform Partners (PP), leading partners in various arenas, for technical inputs to deploy solutions.
- 4 Membership to a global network of cities with opportunities to share best practices.

To build resilience in Pune, we built consensus and allies across the ecosystem

“ Officials and political office bearers will keep changing, and hence, for resilience to be **truly entrenched** in the city, its **citizens** must take **ownership** of the Resilience Strategy. ”

HON'BLE KUNAL KUMAR
 Joint Secretary, MOHUA, GOI | 100RC City Leaders Advisory Committee | Former PMC Municipal Commissioner



Figure 2: Key milestones

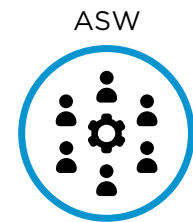
We investigated shocks/stresses and diagnosed the city on 12 resilience parameters

CHRONIC STRESSES weaken the fabric of a city on a day-to-day or cyclical basis

■ Top stresses in Pune: Mobility, health of water bodies, access to affordable housing, air pollution, and solid waste management

ACUTE SHOCKS are sudden, sharp events that threaten a city

■ Top shocks in Pune: Flooding/extreme rainfall, and disease outbreak



ASW

60+

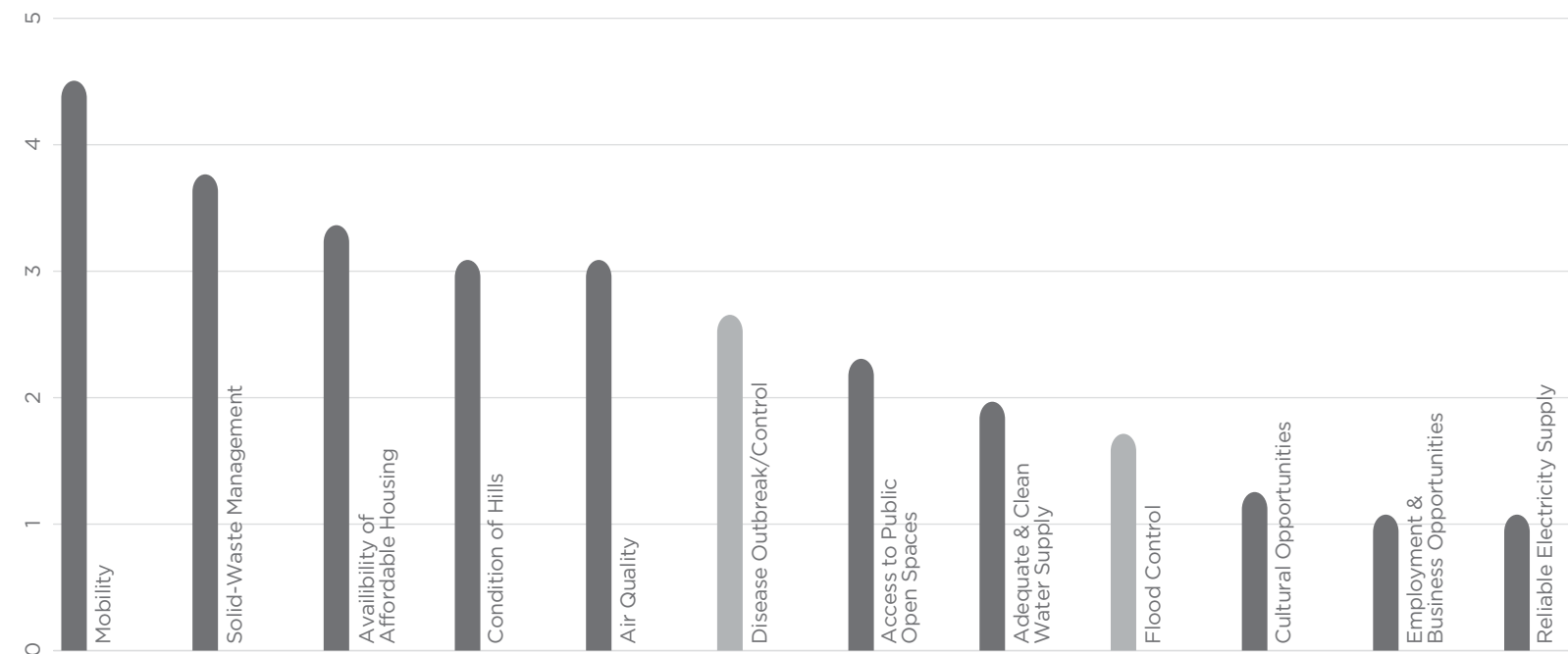
Experts prioritized shocks & stresses based on frequency and severity



Citizen Survey

500+

Citizens rated 12 shocks & stresses based on perceptions



Average rating, participants rated from 1 (not a challenge) to 5 (most important challenge) **Figure 3: Shocks and Stresses in Pune**

PUNE'S RESILIENCE AS PERCEIVED BY STAKEHOLDERS

An evaluation of the city's resilience, based on detailed stakeholder inputs across thematic working groups, expert surveys, and expert interviews, indicate the following

- Areas Of Strength
- Doing Well, But Can Improve
- Need To Do Better



ACTIONS BEING UNDERTAKEN IN PUNE

An analysis of 300+ actions (plans, strategies, programs, projects, practices, initiatives, legislations, and funding actions) designed to contribute to the protection, functioning or advancement of the city, via the 100RC's City Resilience Framework revealed that

- Areas Of Deep Engagement
- Areas Of Mild Engagement
- Areas Of Low Engagement

RESILIENCE THEMES

- 1 Meets basic needs
- 2 Supports livelihoods & employment
- 3 Ensures public health services
- 4 Promotes cohesive & engaged communities
- 5 Ensures social stability, security & justice
- 6 Fosters economic prosperity
- 7 Maintains & enhances protective natural & manmade assets
- 8 Ensures continuity of critical services
- 9 Provides reliable communication & mobility
- 10 Promotes leadership & effective management
- 11 Empowers a broad range of stakeholders
- 12 Fosters long-term & integrated planning

Figure 4: Resilience Perceptions and Actions

To create the Resilient Pune Strategy with 3 pillars, 10 Goals, 28 actions and over 40 projects

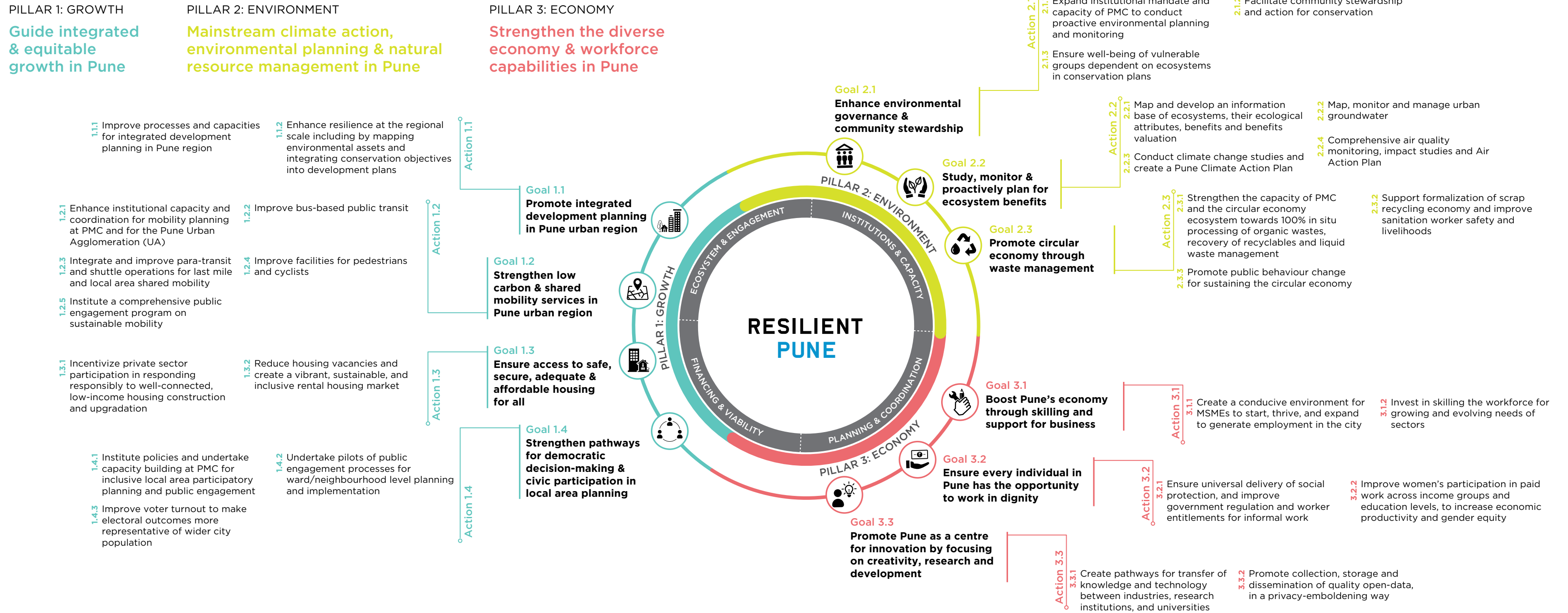


Figure 5: Pune Resilience Strategy



CITY CONTEXT

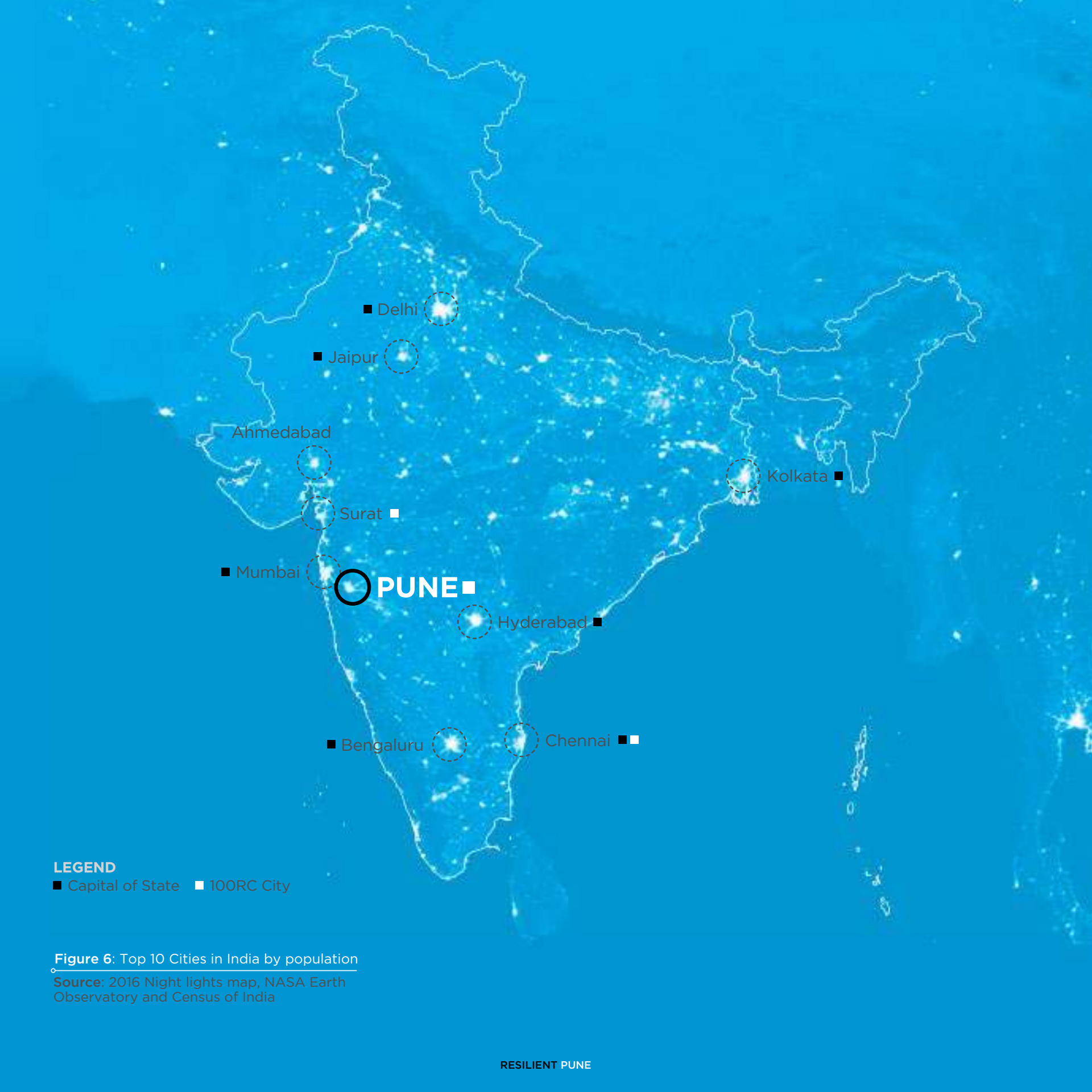
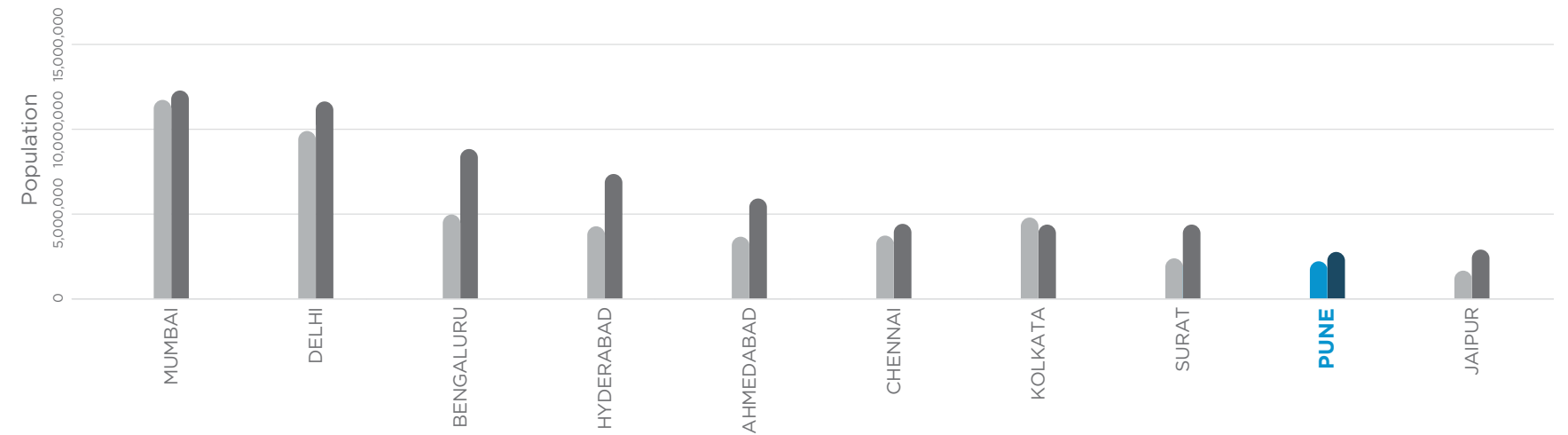


Figure 6: Top 10 Cities in India by population
 Source: 2016 Night lights map, NASA Earth Observatory and Census of India



LEGEND
 ■ Census 2001 ■ Census 2011

Figure 7a: Population growth of the top 10 most populous urban agglomerations of India; Source: Census data

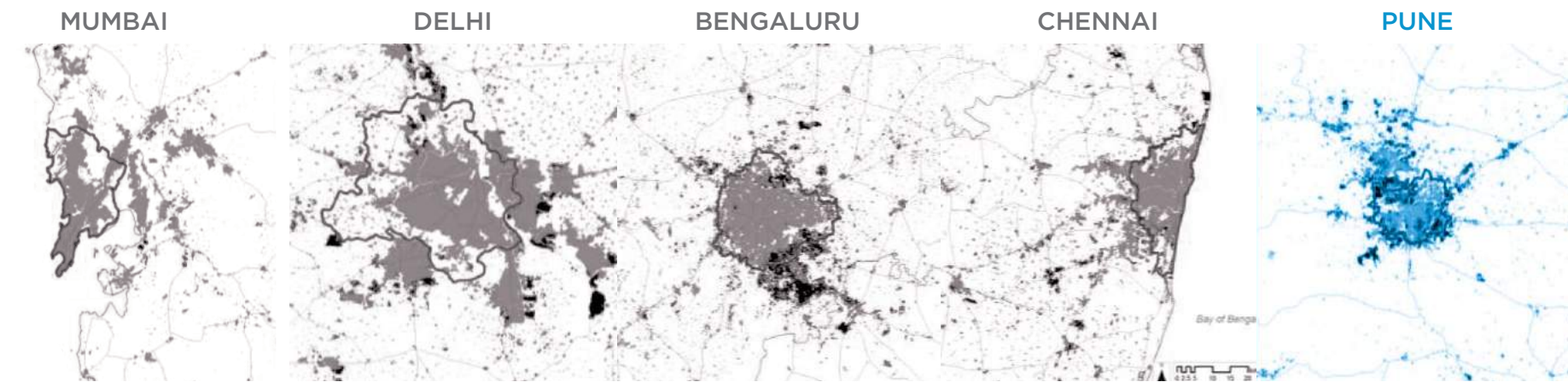


Figure 7b: Map showing urban expansion; Source: World Resource Institute

Pune has several accolades



1st in urban **governance** across 23 Indian cities in ASCIS survey, 2018



1st in ease of **living** across 111 cities in India, MoHUA, 2018



1st in **quality of life** in India along with Hyderabad, as per Mercer, 2014



2nd largest varsity in India with **811 colleges**



2nd in India in **software exports**



7th highest **GDP** among Indian cities at **\$69bn**, Brookings Institute (2014)

Pune and its twin city of Pimpri-Chinchwad are part of a growing urban agglomeration within the Pune Metropolitan Region

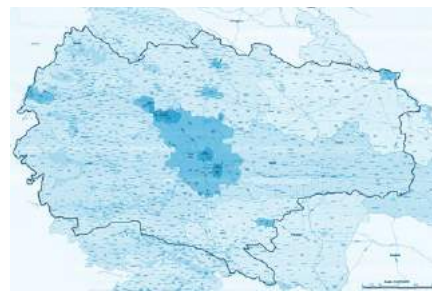
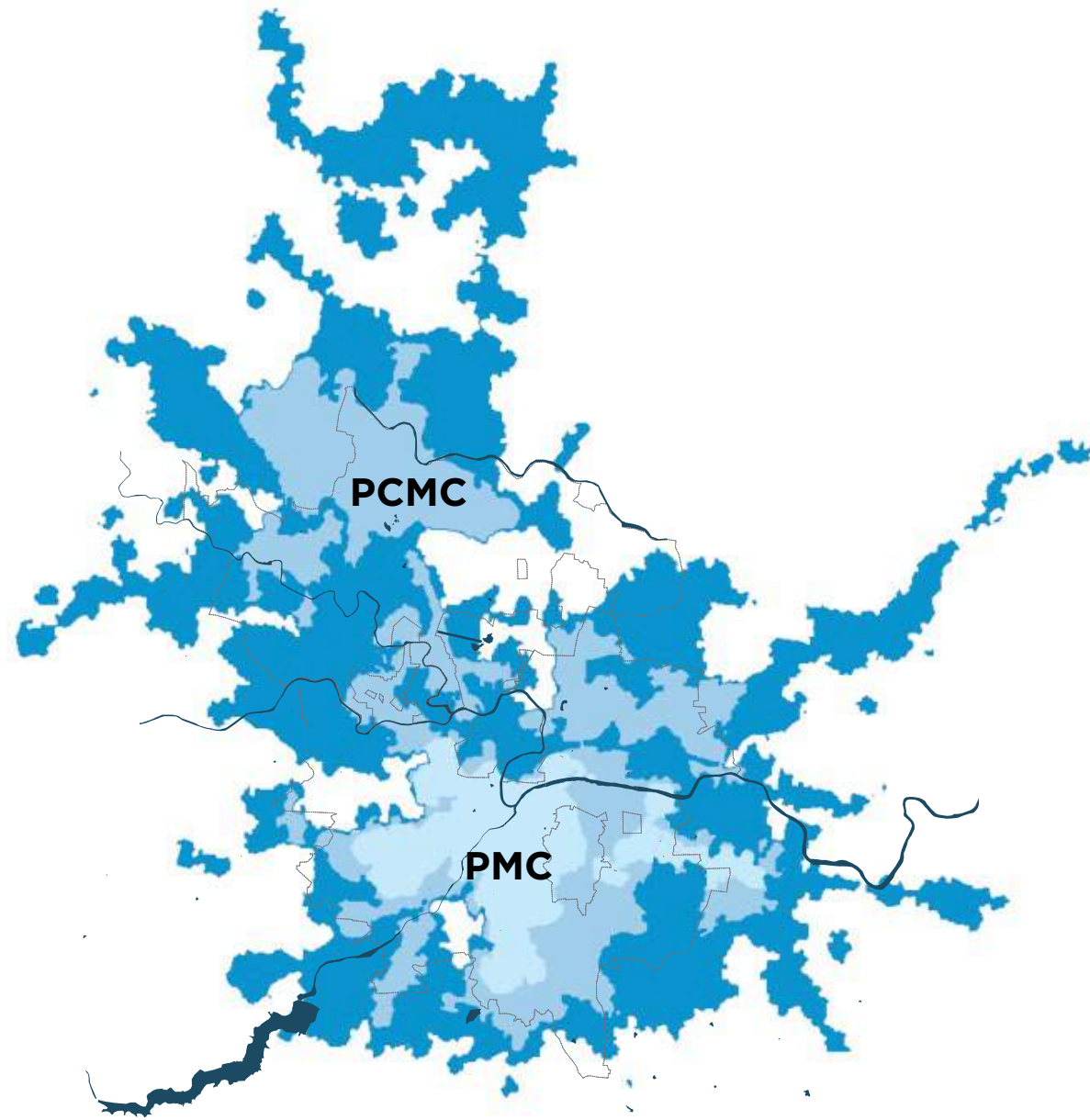


Figure 8: Pune Metropolitan Region

LEGEND
 ■ 1991 ■ 2001 ■ 2017
 Growth footprints by years:
 - - - - PMC/PCMC

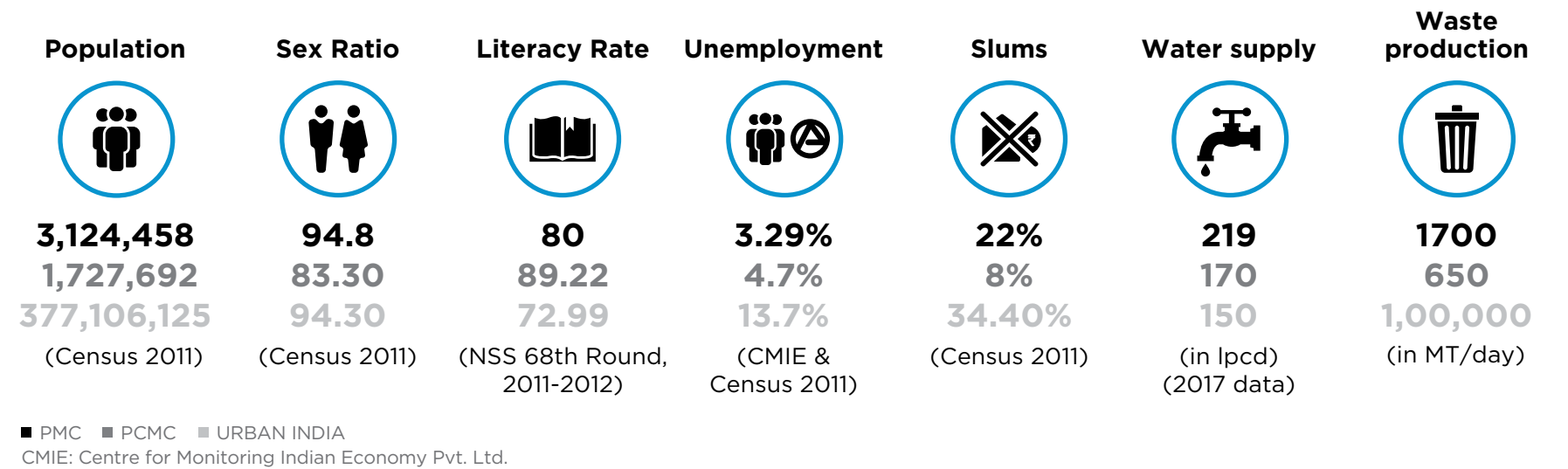
Figure 9: Expansion of Pune Urban Agglomeration*



	PUNE METROPOLITAN REGION	*PUNE URBAN AGGLOMERATION	PUNE CITY	PIMPRI-CHICHWAD	TOTAL CANTONMENTS
Area (sq. km)	7,256	585	**251	181	67
Population (2011 census)	7,276,000	5,057,709	3,124,458	1,727,692	199,426
Density (/sq. km)	1,003	8,649	12,470	9,545	2,984
Governing Body	PMRDA	n/a	PMC	PCMC	Cantonment Boards

Note: *Pune Urban Agglomeration includes- Pune City, Pimpri-Chinchwad, three cantonments of Kirkee, Dehu Road, Pune and one census town of Dehu.
 **Pune City area of 250.56 sq. km. (in 2013) went up to 331.56 sq. km. when 11 fringe villages were included within the city limits, in 2017. After merging of remaining 23 villages, the PMC jurisdiction area is likely to go up to 465 sq. km.

Figure 10a (top) and 10b (bottom): Comparison of different jurisdictions in the Pune region



Multiple administrative institutions look after governance and service delivery in the Pune urban agglomeration

AGENCY	ROLES AND RESPONSIBILITIES	JURISDICTION
Pune Municipal Corporation (PMC)*	Municipal authority administering sectors of - water supply, sewerage, solid waste management (SWM), health, social development, roads and allied infrastructure except public bus transportation etc.	Pune City
Pimpri-Chinchwad Municipal Corporation (PCMC)		Pimpri-Chinchwad
Pune Metropolitan Region Development Authority (PMRDA)*	Regional authority responsible for planning and development for Pune Metropolitan Region.	Pune Metropolitan Region
Maharashtra Industrial Development Corporation (MIDC)	State corporation that provides businesses with infrastructure such as land (open plot or built-up spaces), roads, water supply, drainage facilities and streetlights.	Maharashtra State
Pune Mahanagar Parivahan Mahamandal Limited (PMPML)*	Special Purpose Vehicle (SPV) formed by a joint venture between PMC and PCMC (60:40) to manage and operate the urban bus transportation system.	Pune City and Pimpri-Chinchwad
Maharashtra Metro Rail Corporation Limited (MAHA-METRO)	Special Purpose Vehicle (SPV) formed by a joint venture between governments of India and Maharashtra State (50:50) to implement Pune Metro Rail Project Phase 1 and all other metro projects in the State of Maharashtra outside Mumbai Metropolitan Region.	Maharashtra State, except Mumbai Metropolitan Region
Maharashtra Pollution Control Board (MPCB)	Regulatory body focused on prevention and control or abatement of pollution of water, air and noise.	Maharashtra State
Irrigation Department	State government department responsible for managing water in rivers, dams and reservoirs (not lakes within ULBs) and various irrigation systems.	Maharashtra State
Pune Housing and Area Development Board	Regional unit of Maharashtra Housing and Development Authority (MHADA), responsible for housing provision under government schemes.	Districts of Pune, Satara, Sangli Solapur and Kolhapur
Pune Traffic Police	Deals with road and traffic safety-traffic regulations, prevention and reduction in the number of accidents as well as inculcating a sense of discipline amongst road users.	Pune City and Pimpri-Chinchwad

Figure 11: Key institutions in the Pune Metropolitan Region

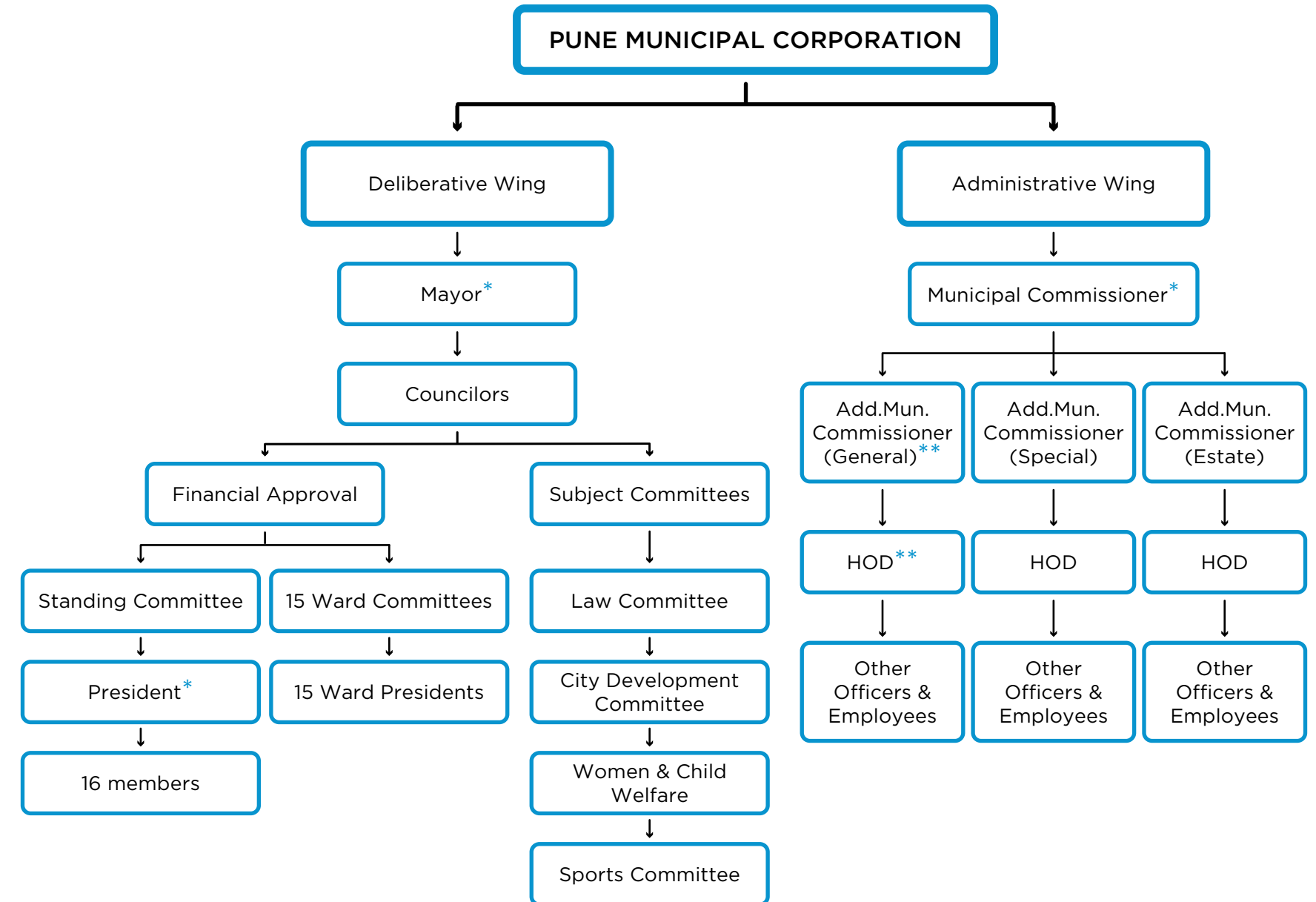


Figure 12: Organizational structure of PMC; Source: PMC Website

Note: * Member of Resilient Pune Steering Committee ** Co-Leads for a Resilient Pune working group

Pune holds significant historical importance in India...

The city's role as the historical capital of the Maratha Confederacy during its opposition to Mughal rule, its contributions in the struggle against the British Raj during India's independence movement, and its place as the locus of many socio-cultural reform movements, has made it an important political and cultural center.

From a group of fishing villages on the Mula-Mutha River, Pune rose to political significance under the Marathas in the 18th century; and retained its importance as a major military base under the British.

Led by Chattrapati (King) Shivaji "Maharaj", what began as a resistance movement against the Mughals, became a powerful empire that dominated much of the Indian sub-continent under Peshwa (Prime Minister) Baji Rao I, with Pune as the seat of its power. The regional economy, based on a closed agrarian and *Balutedari system (artisans)*, frequently disturbed by famines, diseases and wars. Pune was not located on any major trade route and it rose to prominence primarily as a political-military center under the Marathas.

After their decline 1818, the new British rulers retained the city as one of their major military bases in the sub-continent. In order to meet the need to create a new class of local individuals to support in the administration of the region, the British introduced the modern education system training government employees, lawyers, doctors and other professionals from the traditional, often high caste, 'literati' that already had been serving the administrative apparatus of the pre-British rulers. Introduction of electric train lines and telegraphic communication, and proximity to Bombay (now Mumbai), which had become a major port under the British, provided significant logistical benefits to Pune, and placed it at an advantage from an economic and military standpoint.

By the late 19th and early 20th centuries, Pune became one of the centers for political unrest against the British rule and a hub for social movements, moving the needle on societal progress in the nation.

Leading figures of the freedom struggle leveraged the printing press to start a local-language newspaper that became the spokes-piece for the Indian national freedom movement. The 'swadeshi movement', an economic strategy boycotting British products and promoting the revival of domestic products and production processes, also started in Pune. The Poona Sarvajanik Sabha, founded to mediate between the Indian government and its people, is the forerunner of the Indian National Congress. The INC went on to become a major force against British rule and became the first ruling party of Independent India.

Prominent leaders and thinkers came forward to set up educational institutions for natives in Pune, like the Deccan Education Society and Fergusson College. Education was inclusive of gender and caste, a pioneering move at the time. Pune saw the rise of crucial civil society organizations for women's rights & education and socio-religious reforms. The first caste-linked national level affirmative action, the Poona Pact, signed between Mahatma Gandhi and Dr. Babasaheb Ambedkar, marked the beginning of the movement against untouchability within the larger freedom struggle against the British.

...It is also one of the most important urban economies in the country

The city's growth is driven by a variety of factors including a knowledge economy, diverse economic engines of auto, manufacturing, IT and IT enabled services (ITES), a fertile hinterland, proximity to Mumbai & the western coastline, and a legacy of cooperatives in Maharashtra. Well positioned to lead the economic revolution in India, vulnerabilities of the unorganized sector, and evolving skilling needs, demand focus.

INDUSTRIAL DEVELOPMENT IN PUNE REGION

Post-independence, with the state government's targeted industrial development policies, Pune and its surrounding areas, including the twin city of Pimpri-Chinchwad, gained economic importance.

Historically, Pune had been a military center whereas Mumbai's economy had industrialized by the mid-20th century with cotton mills producing export-oriented yarn. The state government responded to regional disparities between Mumbai and Pune with new economic policies. In 1962, Maharashtra Industrial Development Corporation (MIDC) acquired, developed and leased out land for industrial development outside of Pune, including in Pimpri-Chinchwad. By 1980, the Mumbai-Pune region had 25% of the state's population and 70% of the industries concentrated on 8.4% of the land.

After the onset of economic liberalization in India in the early 90s, Pune has seen significant investments, expanding its manufacturing, automotive and IT industries fueled by the availability of highly skilled labor.

After the Indian economy was liberalized in the early 90s, the city has become one of the most attractive destinations for investments across the country. This development has been supported by the many automobile & auto-ancillary manufacturing (Ford, Volkswagen, Fiat, Bharat Forge etc), and ICT companies (Infosys, IBM, Accenture, etc. employ over 200,000 professionals today) that have set-up shop and expanded their presence in the city since the early 90s, supported by various government schemes (e.g. Software Technology Parks of India (STPI) scheme).

These companies were fueled by a steady pipeline of graduates from engineering colleges in the city (9 universities and over 100 higher education facilities). Pune currently continues to lead the country in terms of employment of highly skilled labor (see figure below). Special Economic Zones (SEZs), introduced in the year

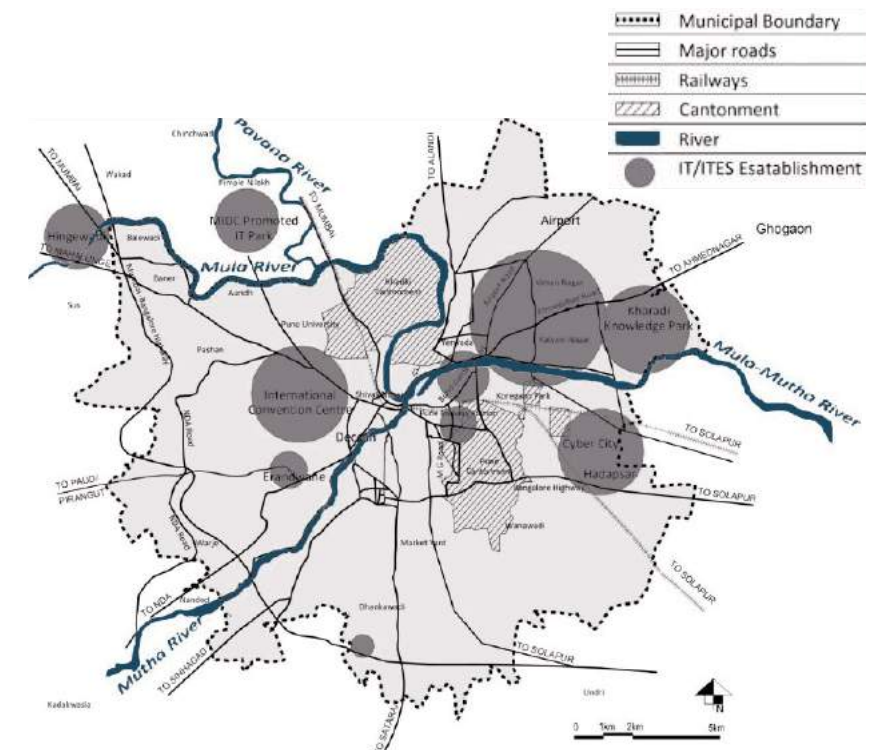


Figure 13: IT/ITES Establishments in Pune; Source: MIDC, 2010

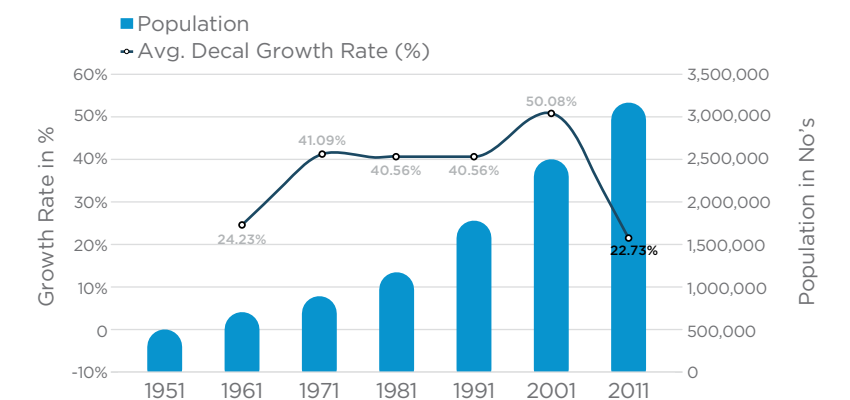


Figure 14: Population growth in Pune

2000, attracted exporters by offering incentives like world-class infrastructure, exemption of taxes, and flexible labor regulations. Infrastructure investments like the Mumbai-Pune Expressway, a new international airport for the Pune Metropolitan Region (PMR), entry of global banks, etc. also contributed to the region's growth.

EDUCATION ECOSYSTEM

Many academic institutions not only produce talent but are also employment centers themselves. In addition, such institutions drive economic activity through their large student population.

Pune has 9 universities and over 100 higher education facilities that generate significant employment in the city. It has also been found that the housing demand around universities is usually high due to the student population in the area, which also creates a market for restaurants and other commercial activities. Thus, universities have a major spillover effect on the local economy of Pune and the PMC benefits from the property tax gains from private academic institutions and housing/commercial developments.

EMPLOYMENT AND SKILL DEVELOPMENT

Drivers like automation and artificial intelligence are expected to increase demand for high-skilled employment, and create new economic opportunities; however, pressure on medium/low-skilled jobs will increase and enhance focus on re-skilling & diversification.

Pune now has the 7th highest GDP among cities in India (USD 69 bn), as ranked by the Brookings Institute (2014). Jobs offered by the knowledge economy in the area have attracted and retained a highly skilled and young workforce (as per census 2011, 30% of the workforce holds graduate degrees and 33% of the city's population is below 30 years of age).

Going forward, technological advances, including AI and automation, are expected to create incremental demand for high skilled jobs in the technology sector, with a positive impact on wages. While high-skilled jobs are expected to expand, some medium and low-skilled jobs across sectors may decrease, potentially because of automation. This may

result in potentially significant job losses in the IT services sector as well. Evolving technological trends present challenges for companies to remain competitive in the future driven by (a) the need to upgrade the organizations capabilities, in part by re-skilling/up-skilling to take on the jobs of the future, and (b) the requirement to handle potential automation in the value chains of sectors. The strategies utilized by the high-skilled sectors in Pune will have a significant impact on the city's economic resilience.

Up-skilling and re-skilling of low-skilled workers, including migrant workers from outside Pune, is seen as essential to provide a pathway for improved livelihoods.

Rural migrants from within Maharashtra, especially from drought affected agricultural areas, have been migrating to Pune for jobs in its growing industrial sectors, to avail quality service delivery (e.g. in education, water supply), and for spillover benefits of proximity to the commercial capital - Mumbai. While Pune has a strong base of educational institutions, there are a relatively limited number of programs targeted at poor people, resulting in limited opportunities for informal workers to join formal work spaces. There are several initiatives, which, if scaled up, could provide much required

skilling solutions, e.g. private sector & philanthropy initiatives like Tech Mahindra's Skills for Market Training program, and city supported programs like Pune City Connect are conducting skill training and job readiness programs for low skilled individuals.

Underlying vulnerabilities of low-income groups continue to demand focus as they limit the upward mobility expected from skilling.

Informal, daily wage workers with poor incomes are forced to move into informal housing due to limited low-income housing supply. Limited asset ownership (~30% of households live in slums without tenure), limited penetration of capacity enhancing/sustaining products and services like health insurance, combined with an uncertain legal environment (e.g. the risk of eviction and confiscation of goods for street vendors) lead to cycles of poverty for many (10.9% households holding below-poverty-line ration cards as of 2008¹). This may limit upward mobility of low-income populations even if skilling programs were to be implemented. Thus, efforts to improve the economic well-being of such individuals need to go hand-in-hand with improvements in access to basic services including low-income housing and government schemes for urban poverty alleviation.

Informal workers in certain sectors in Pune and farmers in the peri-urban areas have self-organized leading to some redistribution of wealth and greater negotiating power for these groups.

A number of organizations have emerged among the low-income residents of Pune and its peri-urban areas. For example, building on the legacy of the well-developed co-operative movement in Maharashtra and taking advantage of Pune's rapid growth, farmers in adjacent areas have voluntarily pooled their land to form co-operatives and have attracted IT companies to setup integrated townships with offices, housing, and amenities, including schools. This has allowed farmers to transition into urban livelihoods and build community wealth. Benefits of co-operation are also being seen among the urban poor. For example, SWaCH Pune Seva Sahakari Sanstha, a waste picker cooperative has succeeded in improving work conditions and livelihoods for the marginalized community

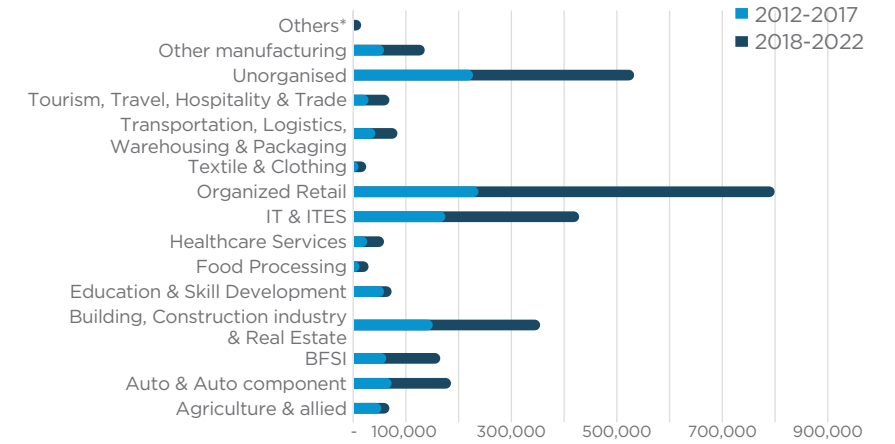


Figure 16: Incremental demand of human resources in Pune District - by sector; Source: IMaCS Analysis

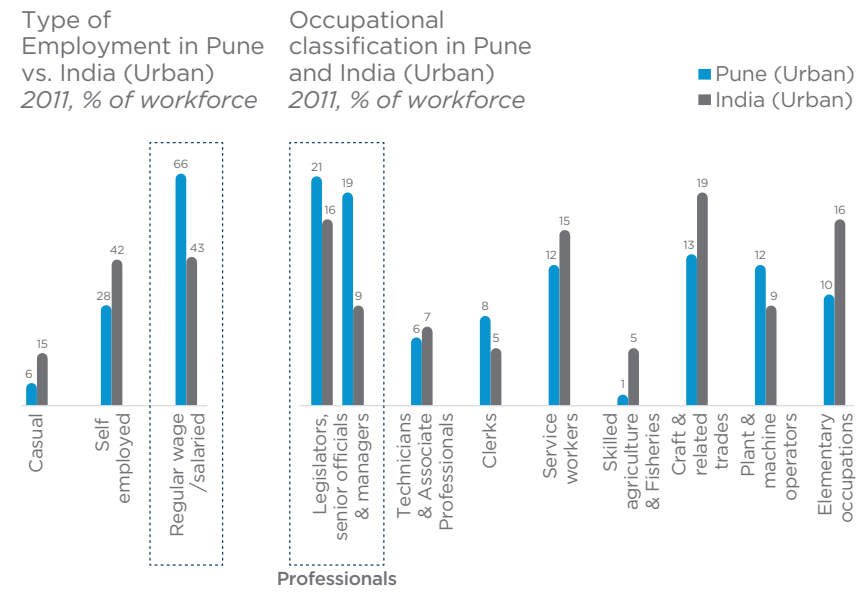


Figure 15: Comparison between Urban India and Pune on skills Source: Pune Profile, Smart Cities

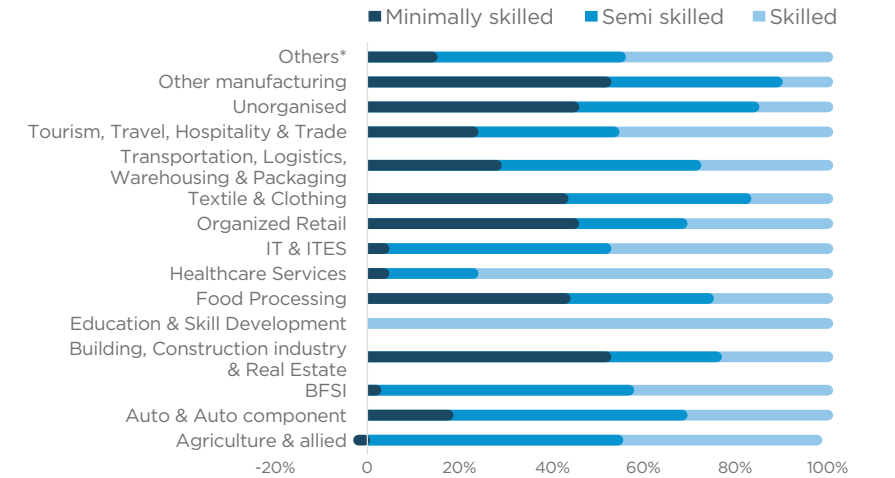


Figure 17: Sector-wise skill demand in Pune District by 2022; Source: IMaCS Analysis

[^]Unorganised sector includes domestic workers, handloom & handicrafts, beauticians, facility management personnel & security guards

*Others include chemicals and pharmaceuticals, electronics, gems & jewellery & furniture & furnishings.

¹ <https://knoema.com/atlas/India/Pune>

However, Pune's infrastructure and spatial growth have been largely unplanned

The rapid rate of urbanization in Pune has not been accompanied by planned infrastructure development and service expansion causing significant stresses such as traffic congestion, lack of affordable and secure housing, and poor service delivery, especially in peri-urban areas

SPATIAL GROWTH

Different politico-economic growth trajectories in Pune's history have manifested in four distinct urban spatial patterns in the Pune metro region, each faced with distinct challenges.

Dense historic core: The seventeen 'peths' (neighborhoods) of the old city, dotted with heritage structures, grew over 150 years between the 17th and 19th centuries under the Maratha and Peshwa rules. With distinct ethnic identity, specialized trade and artisans, commercial activities in the peths have continued to date attracting heavy vehicular traffic in its narrow lanes. Poor traffic management has caused severe congestion and reduction in air quality here. The city core is also the densest part of the city today where Bhavani Peth and Kasba Vishrambagh Wards have densities of 661 and 445 persons/Ha², much above the national norms of 125-175 persons/Ha.

Spacious military cantonments: By the early 19th century, cantonments were set up outside this core to accommodate British military troops and over time military officers and civilians set up sprawling bungalows, schools, colleges and hospitals. Cantonment Boards, which incorporate both elected representatives and members of the military, govern these low-density areas with wide avenues.

Serviced industrial developments: Post-independence in 1947, large land tracts around Pune were acquired and serviced with roads, and water supply for industrial development, under the umbrella of the Maharashtra Industrial Development Corporation (MIDC). These areas did not mandate residential and commercial development until 2015, because of which squatter settlements for migrant laborers sprung up around MIDC lands, along riverbanks, railway lines, and on hill slopes. Many middle and high-income employees commute daily from Pune to these industries on the outskirts with implications on traffic commute time and air pollution levels.

Unplanned fringe developments: By the mid-90s, large IT/ITES hubs and educational institutions were developed on lands converted from agricultural use, in the fringe areas of

Pune. Private developments meet the consequent housing demands for professionals and students in this rapidly urbanizing zone. Many of these developments face with water shortages since they fall under the jurisdictions of village panchayats, and are therefore not connected to city water supply and sewerage systems.

Pune City area of 250.56 sq km (in 2013) went upto 331.56 sq km when 11 fringe villages were included within the city limits, in 2017. After merging of remaining 23 villages, the PMC jurisdiction area is likely to go upto 465 sq km. This will make PMC the largest corporation in Maharashtra compared to BMC with an area of 413 sq. km. Increase in land area together with a projected 37%³ decal growth in population raises concerns about the city's capacity to provide services and guide growth.

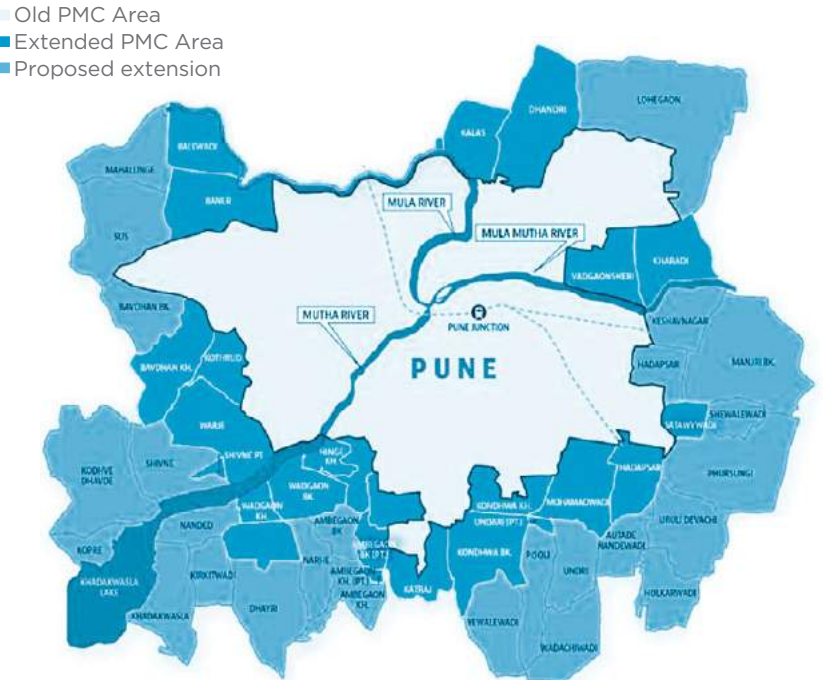


Figure 18: Proposed expansion of PMC jurisdiction; Source: PMC

² https://pmc.gov.in/sites/default/files/project-glimpses/Draft_City_Development_Plan_for_Pune_City_2041_Vol-1.pdf
³ https://pmc.gov.in/informpdf/CDP/1_CDP_Intro.pdf



SPOTLIGHT PUNE LIGHTHOUSES

Lighthouse is a flagship project of the Pune City Connect (PCC), an industry-led corporate social responsibility (CSR) platform working in partnership with the PMC. Under PCC's Sustainable Livelihoods program, Lighthouse centers located close to slum communities (aimed at one per ward) provide the underprivileged youth of Pune with the chance to enhance their skills based on individual interests and connect them to meaningful career opportunities. A successful example of the private sector and local government working together, the Lighthouse provides a blueprint for Resilient Pune initiatives.



SPOTLIGHT SWaCH MODEL

The wholly worker-owned SWaCH cooperative - born in 2007 to provide front end waste management services to the city of Pune and recover user fees, entered into a formal memorandum of understanding with PMC for door to door collection of waste in 2008. SWaCH is the success story of how thousands of waste pickers in Pune, India came together to get first and rightful access to recyclable waste.

Private contracts to Waste management companies threatened the livelihood of waste pickers who depend on recyclable waste (paper, metal, plastic, and glass) to sell and make a living. The cooperative is the direct result of the advocacy of KKP (established in 1993). The Cooperative has 3000 members (and growing) who are engaged in door step collection of waste in Pune who are KKP members or their family members. Members are not paid by municipality for this work but collect user fee for door step collection from citizens with sale of scrap is their other source of income. The Corporation saves approx. Rs.12 crores each year in this model.

HOUSING

Housing supply and access have not kept pace with economic growth and demographic demands of the city, reflecting in elevated prices, high demand in fringe/peri-urban areas and 22% of the population living in slums.

As per Census 2011, 22% of the city's population lives in informal settlements with variable security of tenure and limited coverage of basic services. In the city core, median home prices have gone up by 50% over the past decade (median home price in Shivaji Nagar increased from approx. INR 5,500/sq. ft to 11,000/sq. ft). Housing developments have therefore moved to PCMC and fringe areas of the city, closer to employment centres. This reflects in Census 2011, which indicates 22.7% decadal population growth in Pune versus 70% in adjacent Pimpri-Chinchwad.

As per a Cushman Wakefield report projecting housing demand-supply between years 2016-2020, low-income groups drive nearly 75% of the demand in Pune but only 4% of the supply; with majority of the upcoming supply directed towards the middle-income group. The major barriers to private developer led affordable housing are availability of low cost developed land as well as government approval processes, in addition to the lack of access to credit for the low-income group.



Figure 19: Housing Supply and Demand in Pune between years 2016-2020; Source: Indian Real Estate - Poised for Higher, 2014, Cushman Wakefield

Wider housing policies seem to have focused on construction of new units, and have not taken a holistic approach to housing.

The Kundu Committee Report released in 2012 concluded that increasing housing stock do not necessarily lead to reductions in housing shortages. The supply demand mismatch, especially in low-income housing segment shows the inability of the current market mechanisms to meet the gap. Civil society organizations in Pune, with support of PMC, have taken an approach of incremental improvement and upgradation of slums, which have the advantage of using existing land footprints and can be done at a fraction of the cost. In addition, according to the Economic Survey of India,

2018, "while there are good reasons for encouraging home ownership, it must be recognized that the rental market is also an important part of the urban eco-system. Unclear property rights and difficulties with contract enforcement have constrained the market in India in recent decades. These problems need to be resolved in order to allow horizontal and vertical mobility as well as to address a related issue - high vacancy rates." According to the Survey, Pune has between 20-25% of the total residential census houses lying vacant compared to about 15% in Greater Mumbai, Delhi, and Bengaluru. This can be explained by outside investors buying real estate in the city for capital appreciation versus income from rental yields.

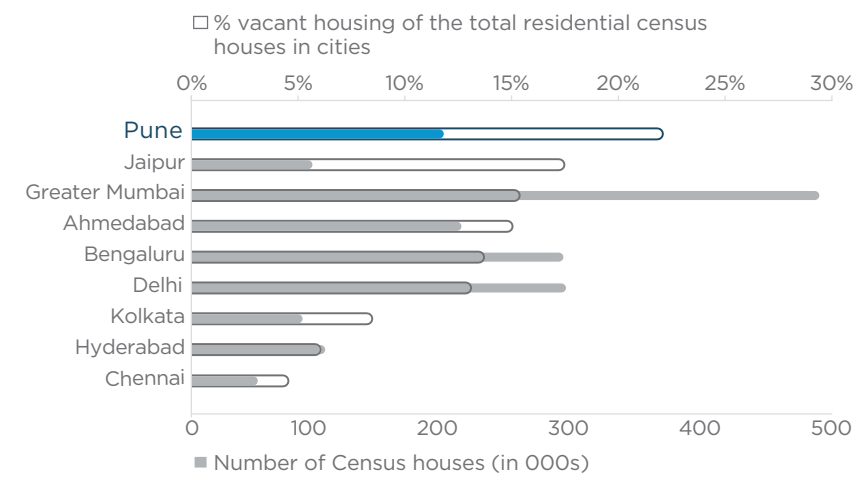


Figure 20: Housing vacancy in Indian cities Source: Census of India (2011) & IDFC Institute (2017)

ACCESS AND MOBILITY

Pune's unplanned rapid growth and lag in the transit system to keep pace has increased dependence on private vehicles in the metro region.

Easy access to finance for private vehicles, convenience of own-vehicles, and a poor transit system have increased dependence on private vehicles, especially two wheelers. The city has among the highest two-wheeler registration rates in India - out of the 3 mn vehicles registered in Pune in October 2015, 75% were two-wheelers. Limited availability of reliable and quality transit has also increased dependency on ride-sharing providers like UBER and OLA, in the middle and high-income segments.

Public transit in the current scenario attracts only about 20% of the population of Pune City, but improving access and

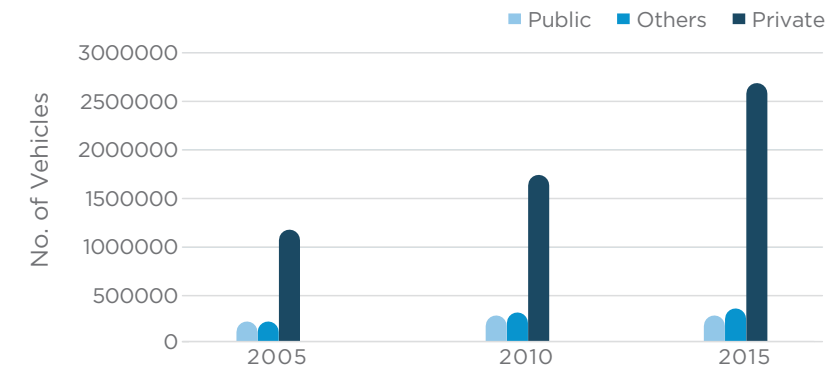


Figure 21: Vehicular distribution in Pune Source: PMC Environmental Status Report 2017

mobility has been a top priority for the city with civil society organizations supporting much of the visioning.

PMPML operates the public bus service, with PMC and PCMC sharing 60% and 40% cost, respectively. For years, PMPML has faced operations and maintenance challenges because of insufficient funds for upkeep, limited parking, inefficient route design due to limited data-driven planning, and poor traffic management systems. Nevertheless, the city has been making improvements in the bus-system especially with the introduction of Rainbow BRTS, which has dedicated bus lanes and Intelligent Traffic Management System (ITMS). Currently 32 km of 112 km is completed. In parallel, the city is also building three metro lines (two routes by MAHA METRO and one by PMRDA) with fare integration and other intermodal facilities between the bus and metro.

The city is also making strides in non-motorized transit with the creation of the Pune Cycle Plan, launch of the Public Bicycle Sharing system, and establishment of the Cycle

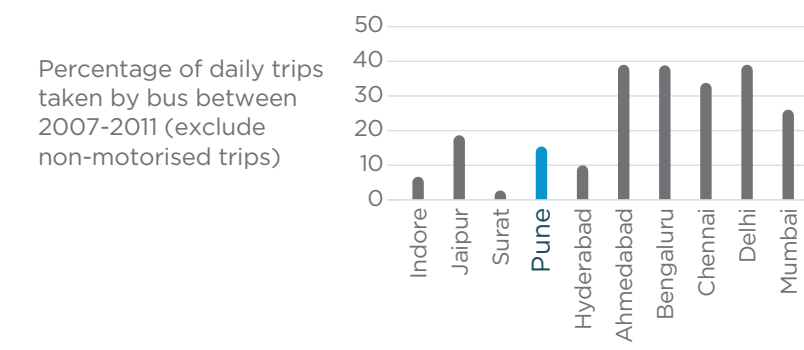


Figure 22: Percentage of Daily trips taken by bus across ten Indian cities; Source: EMBARK India (Now World Resource Institute)

Department within PMC to oversee development. Street improvements of major traffic roads with reduced parking spaces, increased sidewalk widths, addition of bio-swales, trees, and furniture have increased foot traffic. This increase pedestrian activity is expected to improve revenues for businesses along the street and make them safer. These successes for Pune are a testament to the close collaboration between the PMC and civil society organizations that have been championing for safe and inclusive mobility in the city.

However, integration between different modes of mobility and with land-use planning remain to be fully explored.

Pune lacks a unified mobility agenda for the city. Different agencies look after different modes, for example PMPML is in-charge of bus-transit, PMC will undertake the implementation of the new cycle plan, MAHA METRO overlooks metro and different local, and state agencies are responsible for construction of roads and bridges. Often these agencies have conflicting mandates and there is no convening authority that coordinates the different initiatives under one common mobility vision. This has led to sub-optimal and often, conflicting efforts and outcomes.

What makes issues more complex is that land-use planning is not well coordinated with transportation. Thus large developments are undertaken without much regard for transit routes and vice-versa. This has led to further reliance on private cars over the years, increasing traffic congestion and commute times.

INITIATIVES ACROSS THESE THREE DIMENSIONS

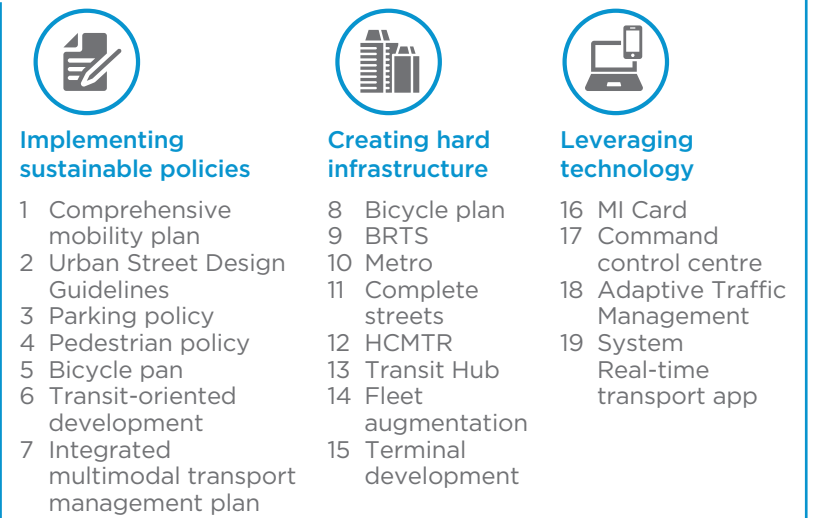


Figure 23: PMC's initiatives to improve access to mobility; Source: PMC

Additionally, the city's ecology and environment are severely stressed and degrading

Pune is rich in natural resources with 35% of its land area under green cover. This provides significant natural diversity in a relatively small area, comprised of hills, wooded forests, rivers, lakes, and parks. The interacting effects of increasing population density, industrialization and urbanization, and poor environmental management practices are causing significant degradation of Pune's environment

Situated in close proximity to one of the most biodiverse regions of India, the Western Ghats, Pune is rich in natural assets.

At a height of 560 m above Mean Sea Level (MSL), the city is characterized by vast stretches of undulating plains interspersed by low and medium ranges of hills. As per the land-use distribution of Pune city, the total land area covered under hills and hill slopes is 5.1%. The rivers of Mula and Mutha, which originate in the Western Ghats, meet in the city to eventually drain into the Bay of Bengal. There are three major lakes in Pune - Pashan (62.6 ha), Katraj upper (7.2 ha), and Katraj lower or Rajiv Gandhi Zoo (18.6 ha). The city is also surrounded by dams - the Khadakwasla, Panshet, Warasgaon and Temghar, that provide water to the city.

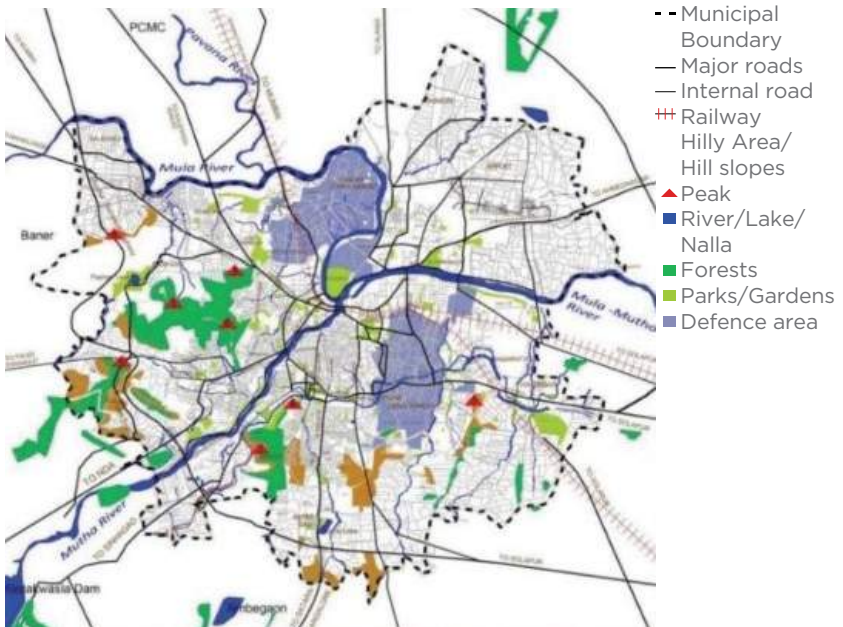


Figure 24: Ecosystem map showing river-sheds, lake-sheds, hill-sheds
Source: Revised City Development Plan For Pune - 2041, Maharashtra, Under Jnnurm

Inadequate solid and liquid waste management practices, especially in upstream settlements, have severely reduced the capacities of the city's ecosystems.

Upstream settlements with limited basic sanitation services, several rapidly urbanizing fringe areas outside the jurisdiction of the PMC, and areas within city limits that are not connected to the sewer system release untreated sewage, industrial effluents, and agricultural run-off into the rivers and lakes. With PMC's sewage treatment plants working at limited efficiency, only 71% of the total generated sewerage in the city is treated while the remaining 29% is released into the rivers untreated (PMC-ESR Report 2017).

In addition, municipal solid waste generation in Pune is among the highest in Indian cities at 1600-1700 tons/day. Challenges such as inadequate coverage in door-to-door solid waste collection (54% household coverage in 2016), inefficiencies in waste processing, and suboptimal citizen behaviour has caused dumping of solid waste in the water bodies.

This has led to high levels of both BOD (Biochemical Oxygen Demand) and COD (Chemical Oxygen Demand) in the water bodies, causing many native aquatic species to go extinct and nuisance species to thrive, resulting in an increase in the cost burden on the city. Water pollution has also increased the risk of water-borne diseases, like dengue and malaria, and has increased the pollution of ground water resources.

The city is undertaking the Mula-Mutha Pollution Abatement project to augment and increase the number of sewage

	2007	2012	ACCEPTABLE LIMIT
BOD (mg/l)	18	52.8	30
COD (mg/l)	67	168.6	150

Figure 25: BOD and COD levels in Mula-Mutha River
Source: PMC Environmental Status Report 2017

treatment facilities. PMC has taken up various initiatives to manage solid waste. One such initiative is the *Strategy Plan for Solid Waste Management 2017-2025* prepared in 2016-17.

Further, destruction of riparian zones has reduced water percolation, compromised ecosystem capacity to mitigate



SPOTLIGHT PUBLIC BICYCLE SHARE, PUNE CYCLE PLAN

A component of the Pune Cycle Plan, the Public Bicycle Share is a public transportation option for short trips in Pune, with the goal to increase bicycle mode share in the city from 8% to 25% by 2030.

Brightly coloured for visibility, the durable, dock-less bicycles eliminate the cost of setting up, operating, and maintaining docking stations. Bicycles work on QR codes and e-payments. The capital expenditure is borne by the Pune Municipal Corporation and the operations and maintenance is done by a private vendor with revenue generated from advertisements, promotions, registration charges, and user fees.



SPOTLIGHT RAINBOW BRTS

Bus Rapid Transport System in the twin cities of Pune and Pimpri-Chinchwad provides dedicated bus corridors along with buses, bus stations, terminals, and an intelligent transit management system, for safe, fast, affordable, and efficient public transit. The system is operated by the Pune Mahanagar Parivahan Mahamandal Limited (PMPML) and the infrastructure has been developed by the Pune Municipal Corporation (PMC), and Pimpri-Chinchwad Municipal Corporation (PCMC). Of the total proposed 113-km length across both cities, 68.8 km has been approved for Pune with financial support of INR 1014 Crores (USD 152 million) from Jawaharlal Nehru National Urban Renewal Mission (JnNURM) of the Government of India. A BRTS cell has been set up in PMPML for inter-agency coordination.

floods, and impacted biodiversity.

Encroachments along the water bodies and channeling have disrupted the riparian zones, causing siltation and other problems, thereby reducing their water holding capabilities. The interruption of the physical integrity of these zones has disturbed habitat corridors resulting in reduced species migration, and reproduction. This is also relevant for the hills in the city, that are encroached upon by informal settlements and unauthorized building construction, as well. Citizen groups have been active in protecting some of these critical assets of the city by carrying out cleanliness and plantation drives.

The city experiences disruptions from flooding of the Mula-Mutha River when upstream dam flood gates are opened. However, a rejuvenation plan for the river is to be implemented and should help in mitigating some of the issues.

Rising air pollution levels, primarily due to vehicular exhaust and construction dust, is a growing public health concern.

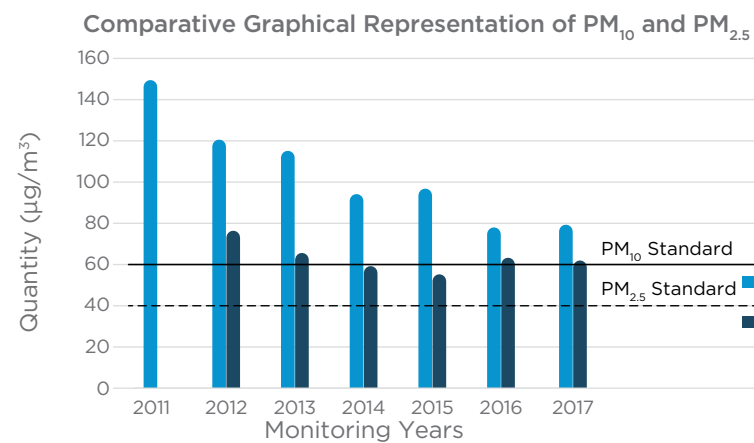
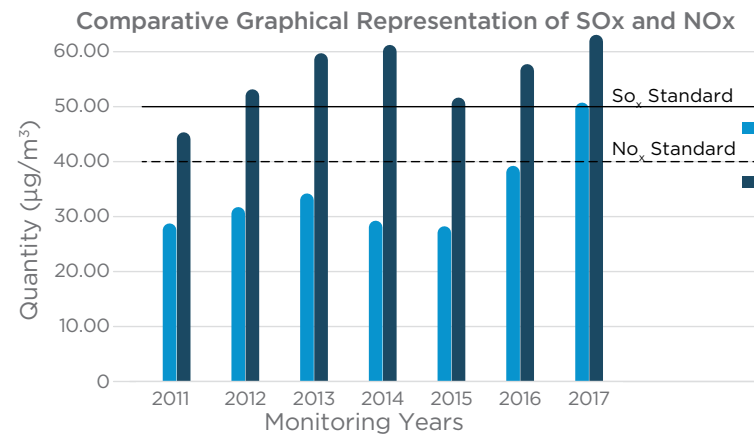


Figure 26: Air pollution in Pune; Source: PMC Environmental Status Report 2017

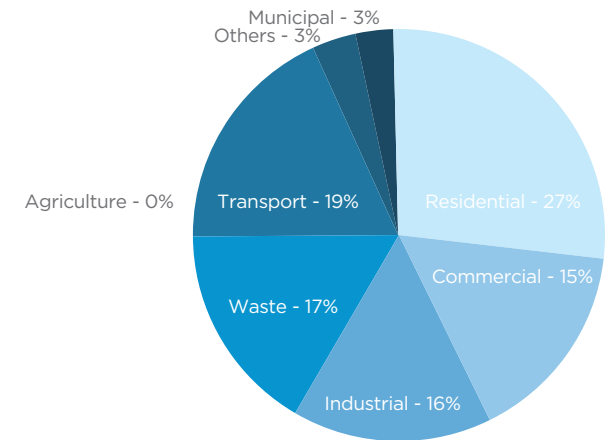


Figure 27: Sector-wise GHG emissions in Pune, 2016-17 Source: Analysis Done by ICLEI South Asia

Pune's air pollution has increased by 35.7% since 2010, as per the Indian Institute for Meteorology (IITM). Emissions from transport (road, rail, aviation), residential activities (cooking, heating, and lighting), and industrial activities, dust from road re-suspension and construction activities, open waste burning, utilization of diesel generators, and brick kiln emissions (150 brick kilns in PMC and PCMC) are all contributing factors.

Particulate Matter 2.5 which can enter the blood stream via the lungs is especially harmful. In Pune, PM 2.5 is at ~56 ug/m³, which is higher than the nation average of 40 and 5 times higher than the WHO guideline of 10. PM 10 levels are higher in the fringe areas due to higher construction activities. Presence of Nitrogen Oxides (NOX) and Carbon Monoxide in the air puts citizens under threat of severe respiratory diseases.

PMC, together with SAFAR, has installed air quality monitoring stations at six locations in the city. The air quality is represented via a colour-coded system that allows the public to easily comprehend the air quality in the Pune Metropolitan Region and to make any adjustments to their personal outdoor plans.

Impact of climate change in Pune has mainly been in the form of increased temperatures, with the 'heat island effect' impacting the health of humans and ecosystems equally.

The Intergovernmental Panel on Climate Change (IPCC) has repeatedly indicated that 'observed warming has been, and transient greenhouse-induced warming is expected to be, greater over land than over the oceans'. These effects have been observed more prominently over the last 50 years as one of the adverse outcomes of urbanization and have had a direct impact on human health and urban energy consumption patterns. Over the past 35 years, more than 20,000 people

have died of heat-related causes in Indian megacities⁴. Pune is impacted by this pattern as well, as climate change has systematically increased temperatures for the city.

Green spaces in and around the city partly mitigate these challenges - Pune currently has over 4 m²/capita of open space, owing to its natural topographic features and green cover, but only specific areas of the city benefit from this green cover.

Functional fragmentation of the public administration system and limited mainstreaming of environmental planning and management have exacerbated challenges, but an engaged civil society has played a leadership role to push key environmental priorities.

Environmental systems are complex and span across administrative boundaries. Bureaucratic management

procedures make planning and coordination for these ecological assets difficult, especially when there is currently no institution mandated to oversee regional, cross-ecosystem planning. Limited efforts in collecting, analyzing and using data to make decisions, has attributed to poor coordination among agencies while hesitance to make information public has limited the participation of private and civil society actors to arrive at solutions.

Development Plans have historically been land-use centric, with the exception of the Draft Development Plan of 2007-2027 that incorporated a plan to protect the surrounding hills by converting them into Biodiversity Parks. Although there are implementation challenges, since almost 40% of the land designated as biodiversity parks is privately owned and needs to be acquired with due compensation, this is a substantial win for the civil society of Pune that initiated and mobilized for this approval to come from the state government of Maharashtra.



SPOTLIGHT MULA-MUTHA RIVERFRONT DEVELOPMENT

The Mula and Mutha rivers have been faced with severe issues of pollution by sewage and solid waste, and see reduced flows of water due to upstream dams. PMC has initiated an INR 2600 Cr river development project where it envisages keeping the river clean and making it pollution-free, reducing risk of flooding, creating a continuous public realm along the river, retaining water, improving city's access to the riverfront, and integrating heritage structures, current activities, parks and gardens.



SPOTLIGHT PASHAAN LAKE RESTORATION-PASHAAN BIODIVERSITY PARK

Pune Municipal Corporation (PMC) had reserved Bio-diversity Parks for restoring the local flora and fauna, to produce carbon sinks and to create awareness about nature conservation. Under the Pashan Lake restoration project carried out under JNNURM* and as part of the biodiversity park, desilted the lake and created an island in the middle of the lake to attract birds. However, the lake faces operations and maintenance challenges after the funding ended and brings to light the need for focus on financial sustainability of other ongoing large-scale projects like that of Mula-Mutha Rejuvenation. Restoration also highlights challenges due to the lack of a singular body mandated to undertake holistic environmental decision-making in Pune.

⁴ <https://geospatialworldforum.org/speaker/SpeakersImages/critical-review-of-the-climate-change-impact-on-urban-areas-by-assessment-of-heat-island-effect-case-of-Pune-India.pdf>

Nevertheless, effective urban governance and basic service delivery are significant levers...

Viewed as a high performing urban local body, Pune has made strides in enhancing service delivery for its citizens; however, considerable coordination is required between various governing bodies to ensure inclusive and sustainable growth, alongside deepening of civil society engagement in decision-making processes.

Pune is part of an ever-growing urban agglomeration, which is governed by two different corporations, parastatal agencies and state-level departments making co-ordination and systems level thinking somewhat challenging.

Pune and its twin city of Pimpri-Chinchwad, considered an industrial township, are both managed by their respective Municipal Corporations and are highly independent, which has implications for how resources are allocated, and how planning is conducted in the broader Pune Metropolitan Region. As described in the previous sections, multiple state and local agencies have mandates to oversee different aspects of a single service or asset.

Pune has made significant advances in service delivery, achieving wide coverage with the political will and resources to do more.

Delivery levels for key public services such as solid waste, access to toilets, and access to water surpass much bigger municipal corporations. Even in informal settlements, access to key public services is better than other major cities (e.g. household toilets are accessible to 55% of slum dwellers and electrification rates are at 90%)⁵. However, the areas of solid waste management and sewerage treatment need improvements across various aspects of their value chains (described in commentary on the right.) The city has undertaken major initiatives to augment capacities and improve in various areas, e.g. the River Pollution Abatement and Sewerage Project, Strategic Waste Management Plan 2017-2025, and 24x7 Water Supply.

PMC has built greater transparency, accountability, and citizen centricity in its administrative processes compared to most other cities in India.

PMC has brought about reform in its property tax regimes, levies on civic services, and introduced transparent accounting practices. Pune has also instituted a system of regularly monitoring major financial transactions with the municipal chief auditor at the helm. Greater transparency has come through the city's open data platform, which has allowed a wide range of stakeholders to engage with Pune's challenges, and hold the local government accountable. The city has also made it easier for citizens to pay their property taxes with payment kiosks set up across the city. Citizens can also voluntarily declare their properties for taxation without attracting any penalties leading to an increase in tax collection.

A vibrant and active civil society in the city monitors the administration on various issues.

Groups in the city have advocated and mobilized for action on various socio-economic, and environmental justice issues. They have done so by proactively providing technical expertise and have negotiated with government and businesses for consensus building. An example of this is seen in The Biodiversity Parks (BDP) project that was included in Pune's draft Development Plan (DP) for 2007-2027, which came to be known as the Green DP by citizens. With considerable pressure from environmentalists, reservation of the land on surrounding city hills for biodiversity parks was approved by the state government. Land acquisition, under PMC Building Dept, is still pending, but once acquired the lands stand to be developed as BDP by the PMC Garden Dept.

DATA AND COMMENTARY ON KEY AREAS OF SERVICE DELIVERY:

Water Supply Management. With 93% of households connected to water supply, Pune has sufficient water, with 219 litres per capita per day (lpcd) at gross level compared to 150 lpcd benchmarked by the Government of India (GoI). To meet 100% coverage, PMC has undertaken the 24x7 Water Supply project to ensure all households in Pune receive safe and equitable supply of water for the next 30 years. The focus has been to improve supply by minimizing losses due to leakages in distribution networks, improving metering, and reducing non-revenue water.

INDICATORS	SERVICE LEVEL (2016)	MoHUA BENCHMARKS
Coverage of water supply connections	93%	100%
Per capita supply of water	219 lpcd	150 lpcd
Extent of metering of water connections	24%	100%
Extent of non-revenue water	30%	20%
Quality of water supplied	100%	100%
Cost recovery in water supply services	92%	100%
Efficiency in collection of water supply charges	87%	90%

Figure 28: Water supply coverage and service levels; Source: AMRUT SLIP - Water Supply

Municipal Sewerage Management. According to the PMC Environmental Status Report 2017, out of the 750 MLD sewerage generated, only 567 MLD gets treated. Inadequate sewage treatment capacity contributes to the ineffective management of grey water and fecal sludge which finds its way into the city's rivers, polluting not just the surface water but also ground water. The city has undertaken the Mula-Mutha Pollution Abatement project supported by JICA, to augment and increase the number of sewage treatment facilities. On the toilets access front, the city has very strong coverage, civil society organizations continue to facilitate the construction of individual and community toilets in slums.

INDICATORS	SERVICE LEVEL (2016)	MoHUA BENCHMARKS
Coverage of latrines (individual or community)	96%	100%
Coverage of sewerage network services	90%	100%
Efficiency of collection of sewerage	52%	100%
Efficiency in Treatment: Adequacy of sewerage treatment capacity	64%	100%

Figure 29: Municipal sewerage network coverage and service levels; Source: AMRUT SLIP - Sewerage

Solid Waste Management. Average total waste generated in Pune is -1,700 Metric Tons per Day (TPD). Pune faces challenges in solid waste collection and segregation of waste at source. In addition, there is also a shortfall in treatment capacity at existing facilities. The city has launched several initiatives to better manage its waste, including a three-year contract for solid waste collection with SWaCH, a cooperative of self-employed waste collectors and other urban poor. The city also rolled out a Solid Waste Management Strategy Plan 2017-2025 with the objective of minimizing waste generated, 100% door-to-door collection, 100% processing, IT enabled monitoring and tracking of waste, etc. The city also intends to completely stop open dumping of waste on landfill sites by 2020.

INDICATORS	SERVICE LEVEL (2016)	MoHUA BENCHMARKS
Door-to-door collection of solid waste management services	54.5%	100%
Efficiency of collection of municipal solid waste	100%	100%
Extent of segregation of municipal solid waste	43.27%	100%
Extent of municipal solid waste recovered	85%	80%
Extent of scientific disposal of municipal solid waste	100%	100%
Extent of cost recovery in solid waste management services	90%	100%
Efficiency in collection of solid waste management charges	79.99%	90%
Efficiency in redressal of customer complaints	80%	80%

Figure 30: Solid waste service levels; Source: PMC Environmental Status Report 2017

⁵ mdpi.com/2071-1050/9/12/2335/pdf

And Pune's robust finances also make it attractive for investments

PMC has exhibited strong financial performance with revenue surpluses supported by effective collection of taxes, transparency and accountability in governance, and political stability. These have enhanced Pune's creditworthiness and attractiveness for investment, unlocking access to large financing pools such as municipal bonds for infrastructure development.

PMC has robust finances compared to other Indian cities with significant dependence on own-source revenue and improvement in per-capita capital expenditure, on average over the last three years.

Pune is the second city in India, after Mumbai, with the highest proportion of own-source revenue, and is among the top three in India, with own sources contributing greater than 50% of the total revenue. Thus, with low dependency on state and national grants, Pune has greater fiscal autonomy compared to other cities in India.

The total municipal budget/revenue has increased from INR 3,167 crores (USD 0.46 Bn) in FY 2013-14 to INR 5,912 crores (USD 0.87 Bn) in the FY 2018-19 budget. Major sources of revenue comprise Goods and Services Tax⁶ (GST) (35%), followed by property tax (30%), and building permission & development fee (14%). The city improved efficiencies in property tax collection by setting up payment kiosks, improving online information, and starting a voluntary disclosure scheme for citizens to declare their property for taxation without penalty. The share of building permission fees in total income reflects the demand for housing and commercial activities and the increasing urban growth in Pune. The city also raised civic taxes like water tax and user charges on public services to ensure that the economic base for the services was covered. For example, it raised water charges for 2016-2017 by 12% and plans to increase them every year till 2020-2021 by 15%. This is expected to lead to a

96% hike from existing rates.

The replacement of Local Body Tax (LBT) with the Goods and Services Tax (GST) might pose some future challenges.

Before introduction of GST, PMC's major source of income was a Local Body Tax, which was discontinued this year (FY 2017-18) in favor of GST. The introduction of a Goods and Services Tax regime in India has meant that municipal corporations across the country have ceased collections of the Local Body Tax (LBT). While the Government of Maharashtra has compensated PMC for the loss in revenue, it is unknown if the compensation will be commensurate with expected LBT collections in the long term. As the entire country adjusts to the new GST rules, PMC may face uncertainty in the transition period. PMC has presented budget surpluses for most of the last few years until this year, with such structural and cyclical changes leading to a deficit.

Despite these challenges, PMC is one of few AA+ rated municipal governments in the country with the opportunity to tap further into commercial markets to access capital for growth.

PMC has decided to undergo a credit rating exercise since the introduction of Jawaharlal Nehru National Urban Renewal Mission (JNNURM). Both India Ratings and CARE Rating have assigned PMC with the AA+ rating with 'stable' outlook. The key drivers for these ratings were higher reliance on



SPOTLIGHT PMC CARE

PMC CARE is a 360-degree framework by PMC to extend various delivery channels to its citizens for effective and responsive governance. CARE stands for Citizen Assistance Response and Engagement. A digitally driven, citizen centric initiative, PMC CARE has been conceived keeping various segments of civic society in mind. It showcases PMC efforts to better the lives of its citizens on every parameter of civic services. PMC CARE aims at providing a multichannel single-window delivery mechanism to provide assistance and response in a more efficient way than ever before. This platform aims to bring city administration one step closer to Pune-kars!



SPOTLIGHT RIVER POLLUTION ABATEMENT AND SEWERAGE PROJECT

PMC is implementing the River Pollution Abatement and Sewerage Project supported by funding from Japan International Cooperation Agency (JICA). A loan agreement was signed on 13th Jan 2016 with JICA for pollution abatement of the Mula-Mutha River in Pune by January 2022, under the National River Conservation Plan. The major components proposed under the project include construction of 11 new Sewage Treatment Plants (STPs), which will result in the creation of an additional treatment capacity of 396 million litres per day (MLD) over the existing treatment capacity of 477 MLD, laying of 113.6 kms of sewer lines, and renovation/rehabilitation of 4 existing intermediate pumping stations. A consultant has been appointed for further support to the project.

The total cost of the project, estimated at INR 990 crores, will be shared in the ratio of 85:15 between the Central Government (CG) and the Pune Municipal Corporation (PMC) respectively.

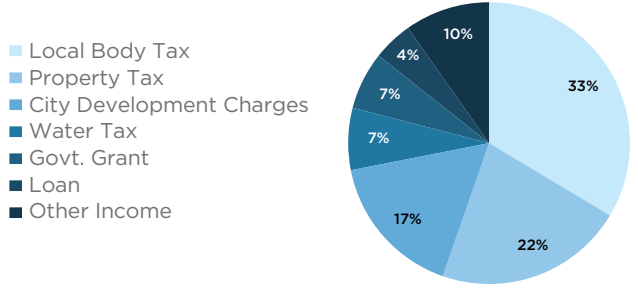


Figure 31: PMC budget for FY 2015-16; Source: PMC

⁶ <https://pmc.gov.in/en/lbt>

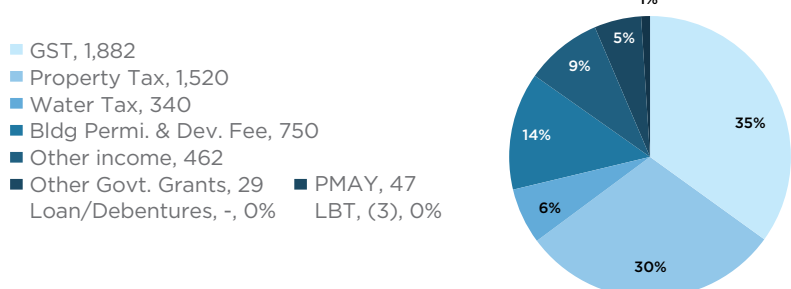


Figure 32: PMC budget estimate for FY 2018-19; Source: PMC

own revenue resources, consistent and growing revenue surpluses, comfortable debt position, resources available for capital investments, double entry accounting adoption, other governance practices, relatively limited impact of Local Body Tax abolition, and efficient coverage of civic

services like water and sanitation against the service level benchmarks set by MoHUA for Urban Local Body (ULBs). Strong creditworthiness has opened the city up for private commercial funds for financing municipal services.

Comparisons of Municipal Balance Sheets ✓ Yes ✗ No

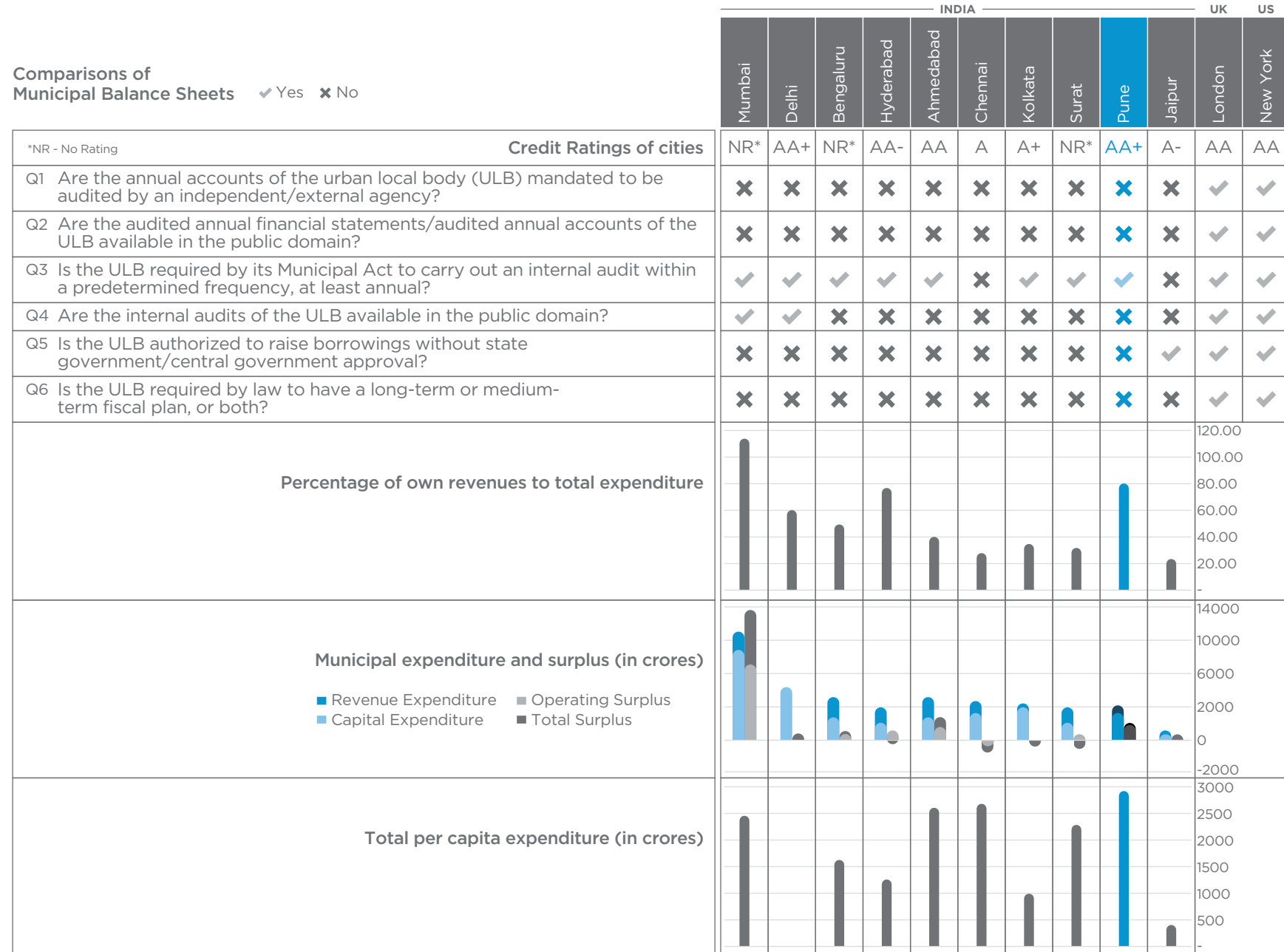
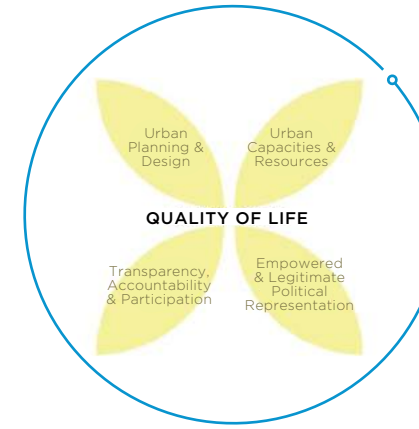


Figure 33: Comparison of municipal finances across cities; Source: ASCIS-2017 Data tables, Janaagraha



SPOTLIGHT
PUNE RANKS 1ST IN ANNUAL SURVEY OF INDIA'S CITY-SYSTEMS (ASICS) 2017

Bengaluru-based non-profit organization Janaagraha Centre for Citizenship and Democracy, released the 5th edition of its Annual Survey of India's City-systems (ASICS) report comparing 23 cities in India along four dimensions of governance: urban planning and design; urban capacities and resources; empowered and legitimate political representation; transparency, and accountability and participation. Pune ranked first, with a score of 5.1 on a scale of 10, followed by Kolkata and Thiruvananthapuram. The report also indicates where Indian metros stand when compared with megacities elsewhere. According to the 2017 report, Johannesburg in South Africa, London in the UK, and New York in the US scored 7.6, 8.8, and 8.8 respectively. See appendix for Pune's report card.



SPOTLIGHT
MUNICIPAL BOND FOR 24x7 WATER SUPPLY PROJECT

In December 2016, the Prime Minister urged Securities and Exchange Board of India (SEBI) and Department of Economic Affairs to ensure that at least 10 cities in India issue municipal bonds within one year in the context of the 'Smart Cities Mission'. Additionally, the Union Government has proposed to give a compensation of 2% interest subsidy on the total size of the bond issue. Both these events have been pivotal in providing an impetus to PMC's Municipal Bonds programme. On June 22nd, 2017, Pune became the first city in the country to issue municipal bonds since the publication of 'Issue and Listing of Debt Securities by Municipalities Regulations, 2015' by SEBI. PMC became the issuer of the largest municipal bond in India's history with an INR 200 Cr (USD 30 million) issue at the Bombay Stock Exchange, Mumbai, to fund a 24X7 water supply scheme for all residents in the city.

PMC aims to mobilize INR 2,264 crore through municipal bonds in five years, starting 2017, for the 24X7 Water Supply project estimated to cost INR 2,818 crore. The first INR 200 Crores were issued in June 2017 at a coupon of 7.59%, which will be paid twice in a year. The debt servicing will be from two streams of revenue, user charges and property tax. The property tax will be parked in an escrow account, which is the designated account for repayments.



RESILIENCE DIAGNOSIS

Image courtesy: Dan Tassone

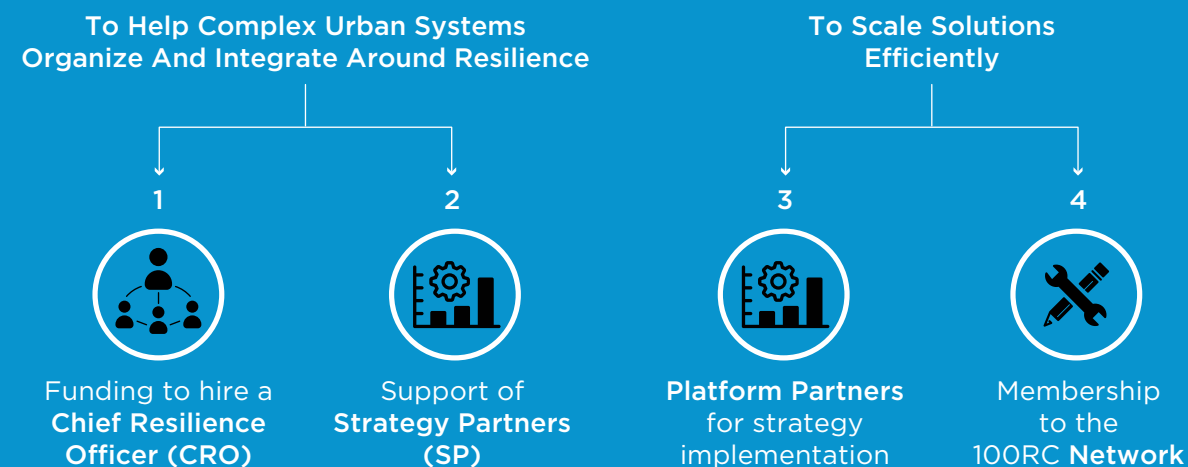
100 RESILIENT CITIES (100RC) INITIATIVE

The 100 Resilient Cities (100RC) initiative, was pioneered by The Rockefeller Foundation. The initiative helped cities build resilience towards their respective social, economic, and physical challenges. It did so by providing technical assistance and tools, access to services of global organizations, and opportunities to exchange experiences and best practices among member cities.

100RC CITY RESILIENCE PROCESS IN PUNE

Pune was selected to join the 100Rc network in 2016. The Pune Municipal Corporation (PMC), led by the CRO's Office, introspected on Pune's shocks/stresses, resilience strengths/opportunities, analyzed ongoing and new initiatives, and developed a resilience strategy. To do this work, the CRO's Office was institutionalized within the PMC. This enabled the team to engage a wide variety of stakeholders, galvanize both public officials and civil society leaders to serve as resilience champions, integrate and mainstream the concept of resilience into city services, plans, and initiatives.

100RC provided 4 types of support to its member cities



ACTIVITY	OBJECTIVE	APPROACH/METHODOLOGY
Prioritizing shocks & stresses	Identifying both acute and chronic resilience challenges	<ul style="list-style-type: none"> ◦ Citizen's perception survey ◦ Expert interviews ◦ Working groups
Identifying Key Resilience Themes	Identifying key resilience strengths and weaknesses	<ul style="list-style-type: none"> ◦ Perception Assessment Tool ◦ Expert survey ◦ Working groups
Synthesising Current Resilience Initiatives	Identifying gaps in existing resilience activities/programs/policies especially in Pune's key weakness areas	<ul style="list-style-type: none"> ◦ Actions Inventory Tool ◦ PMC Heads of Departments ◦ Expert outreach ◦ Desk research
Developing Resilience Strategy	Creating visions, goals, actions and projects to build resilience in Pune	<ul style="list-style-type: none"> ◦ Visioning Workshop ◦ Opportunity Assessment ◦ Expert interviews

100RC City Resilience Process in Pune

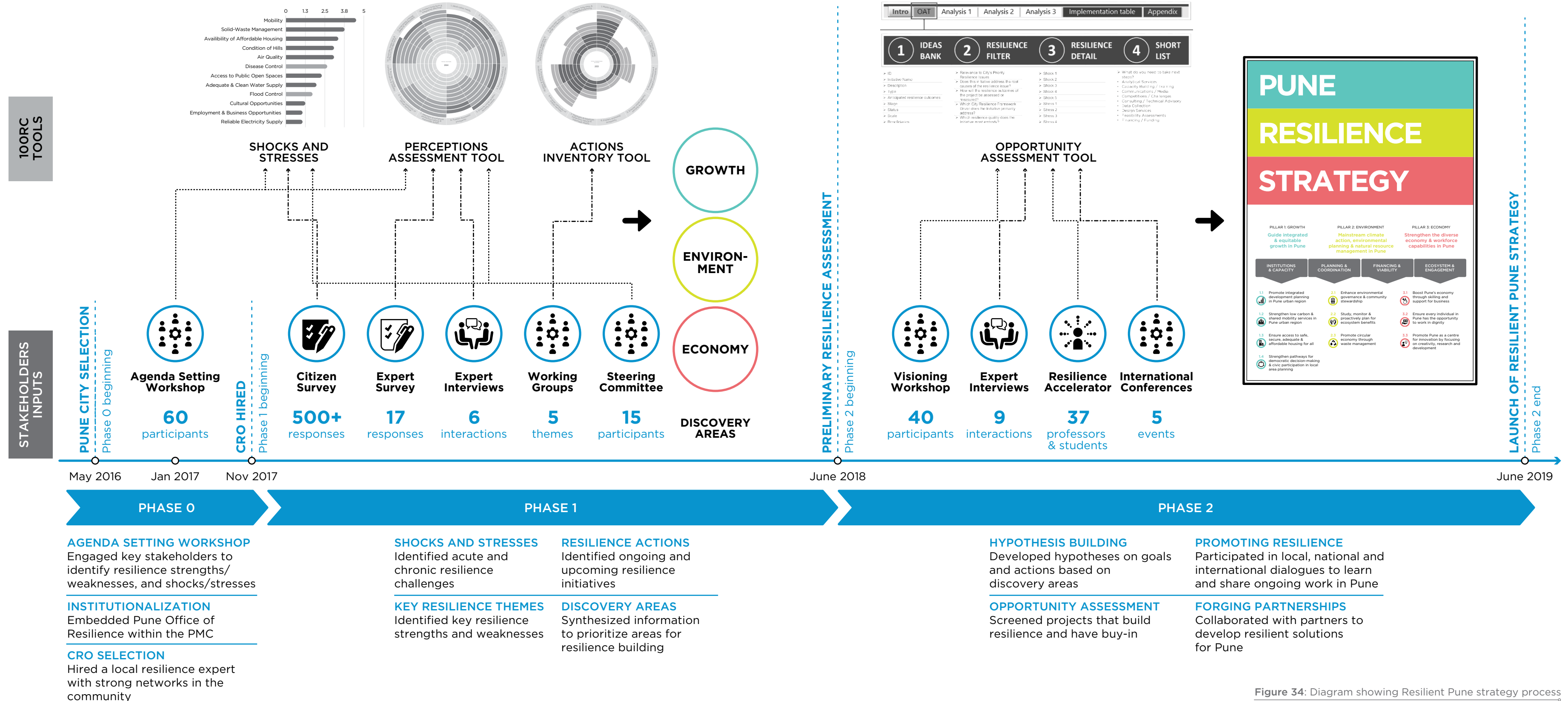


Figure 34: Diagram showing Resilient Pune strategy process

Stakeholder Engagement



GAIN TRUST

The CRO spent considerable time in the beginning of Phase 1 in stakeholder engagement. Because the Pune Office of Resilience is institutionalized within the PMC, the CRO has been designated office space within the PMC Disaster Management Cell. With initial support and guidance from the Commissioner's Office, the CRO has been able to have significant face time with various heads of departments, technocrats, and key personnel working in the corporation. His ability to navigate through institutional hierarchies and perseverance in building one-on-one relationships helped him gain trust. Stakeholder mapping done with the strategy partner and the CRO's own professional networks, helped the team identify individuals in other local government offices, academia, and in the private and civil society sectors who provided insights and can be potential collaborators.

BUILD CREDIBILITY

The CRO's technical background in civil engineering, professional work in urban consulting, and deep understanding of Pune through lived experience helped him build initial credibility with people. Through Phase 1, he was able to identify champions that became anchors for some of the thematic working groups and helped him understand nuances of challenges and actions taken by the city. In turn, he has been leveraging the 100RC platform to connect them with necessary support, like technical knowledge or global best practices when needed, and has also been creating space for them to take ownership of how the strategy is designed.

PROVE VALUE

The working groups for Pune have been very well attended and average to about 15 members per group. This has required the CRO to make phone calls to each member at least twice besides email communication to coordinate schedules and ensure they prioritized attendance. A briefing document with participants before the meeting and a summary note shared after have ensured transparency and allowed for information to be documented and disseminated. Visits by the 100RC Pune team to meet with the mayor, commissioner, additional municipal commissioners, and key staff members, learn about their perceptions of shocks and stresses and share the 100RC offering, has given the PMC more confidence in the CRO's Office and the value it brings. One such meeting directly resulted in an Additional Commissioner presiding over a working group on environment giving the CRO greater convening power.

The CRO spent time in building valuable relationships both inside and outside the PMC to synergize efforts and build coalitions.

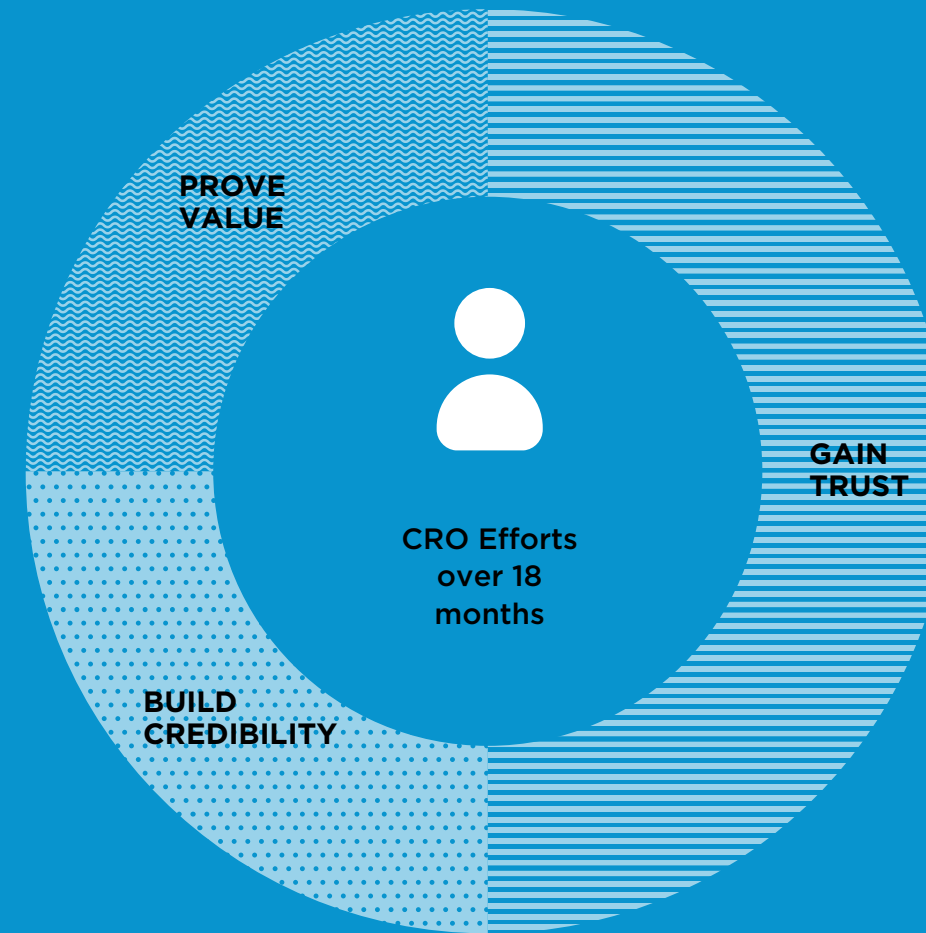


Figure 35: Time spent by Pune CRO

% Time	Activity
GAIN TRUST	
10% PERSUASION	HODs, Commissioner & team
15% OUTREACH	Emails/calls in coordinating for working groups, creating and sharing discussion outputs
20% SOCIAL CAPITAL	One-on-one with stakeholders, PMC socials
BUILD CREDIBILITY	
30% KNOWLEDGE	Bringing in inputs on on-going projects from 100RC network
20% CONNECTIONS	Connecting stakeholders to each other and 100RC network
PROVE VALUE	
25% RESOURCES	Budget allocation for PMC Environmental cell
25% PARTNERSHIPS	On-going UNGC, Columbia University

THE CRO's team has been involving key ecosystem partners to help shape priority areas for the Resilient Pune Strategy

PMC	OTHER GOVT	ACADEMIA	CIVIL SOCIETY	PRIVATE	MULTI-LATERAL	CITIZENS
Social Development Dept. Environment Dept.	PMRDA PMPML POLICE MSRDC PSCDCL CIRT PCMC	BVIEER COEP BNCA Columbia University	CEE ITDP WRI JIVIT NADI ECO. SOC. IDFC INSTI SHELTER	MCCIA KPIT L&T HCP NJSEI	ADB IFC	



We have been engaging ongoing and new initiatives set up by other philanthropic organizations and institutions in Pune to synergize efforts

- IFC has selected Pune and Pimpri-Chinchwad as Eco cities, providing advisory, and lending support in areas of e-mobility, NMT, solid waste & waste water management
- BLOOMBERG PHILANTHROPIES has initiated a two-year support to Pune to combat air pollution
- ICLEI has set up a Solar Cell within the PMC as part of their Solar Master Plan for Pune City. Pilot projects under the cell are to be funded by the central govt
- NITI AYOG AND ROCKY MOUNTAIN INSTITUTE has selected Pune to set up an Urban Mobility Lab
- BERNARD VAN LEER FOUNDATION under its 'Child-Friendly Cities' programme, has set up a two-year partnership with Pune
- ADB, IFC, and DFID are keen to invest in municipal and green bonds



Living Laboratory at Pune Bicycle Share in Aundh



Working group on Pune Metro Growth at PMRDA



Living Laboratory at Pune Lighthouse in Aundh

Resilience Shocks & Stresses

The city's shocks and stresses were prioritized based on inputs from citizens, government officials, civil society leaders, academics, and private sector leaders. A citizen survey was deployed online and offline, which helped identify priority shocks and stresses. These were juxtaposed to results from the agenda setting workshop (annex) and other stakeholder interactions. Based on this, 'Mobility', 'Air Quality', 'Availability of Affordable Housing', 'Garbage Management', 'Health of Water Bodies', and 'Condition of Tekdis/Hills' were identified as priority stresses, while 'disease outbreak' as a priority shock area for the city. Below, each stress and shock, and its implications are discussed.

CHRONIC STRESSES weaken the fabric of a city on a day-to-day or cyclical basis

Top stresses in Pune: Mobility, health of water bodies, access to affordable housing, air pollution, and solid-waste management

ACUTE SHOCKS are sudden, sharp events that threaten a city

Top shocks in Pune: Flooding/extreme rainfall and disease outbreak

Citizen Survey



500+
Citizens rated 12 shocks & stresses based on perceptions

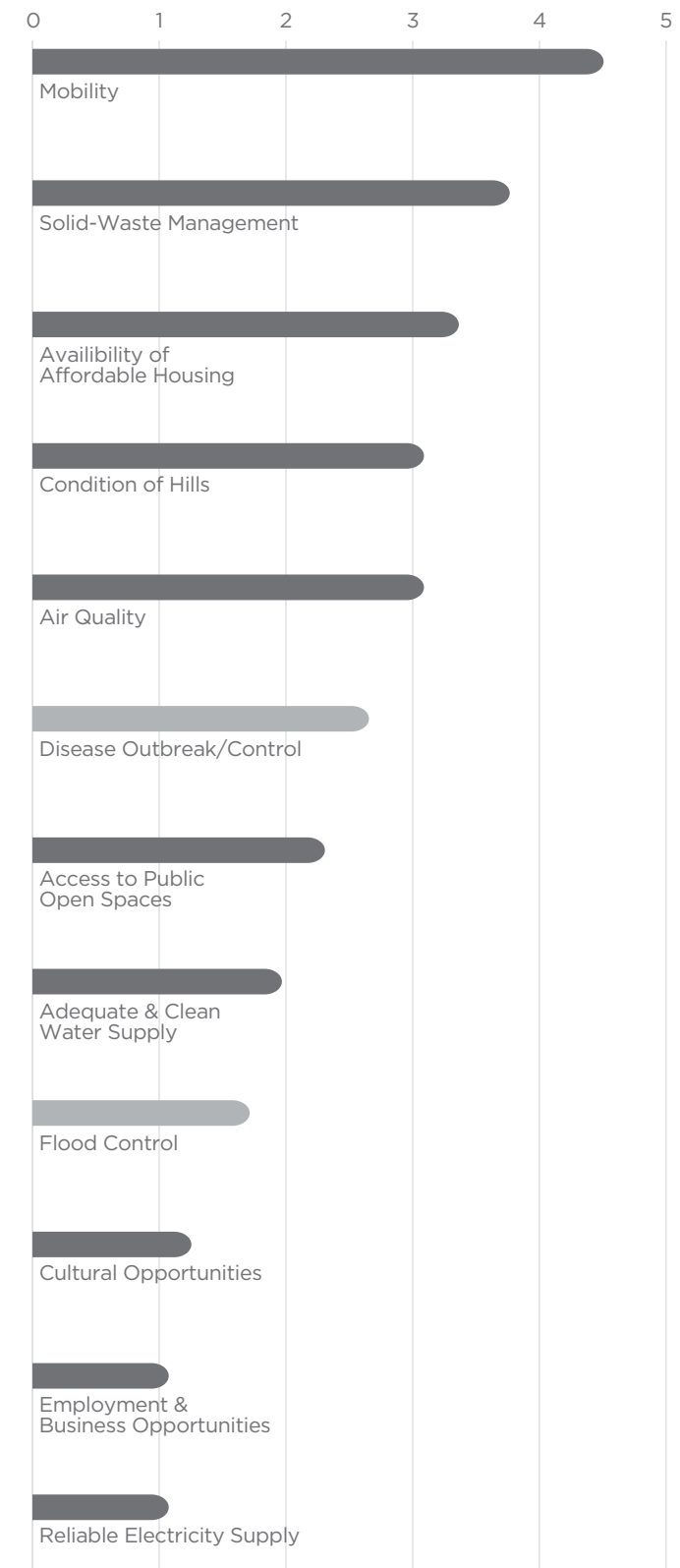



Figure 36: Citizen's Perception Survey
Average rating, participants rated from 1 (not a challenge) to 5 (most important challenge)

ASW



60+
Experts prioritized shocks & stresses based on frequency and severity

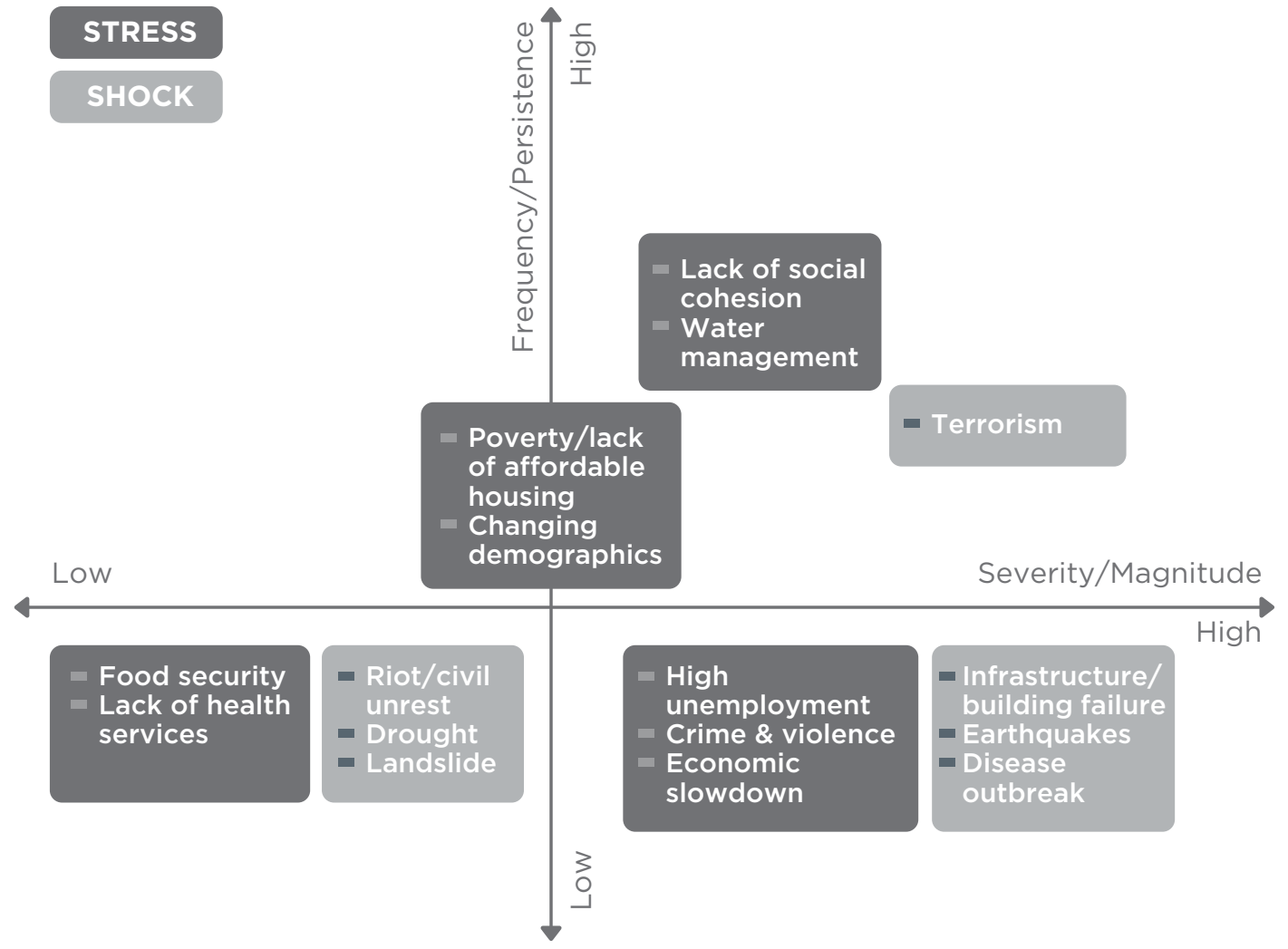


Figure 37: Key shocks and stresses identified in the Agenda Setting Workshop

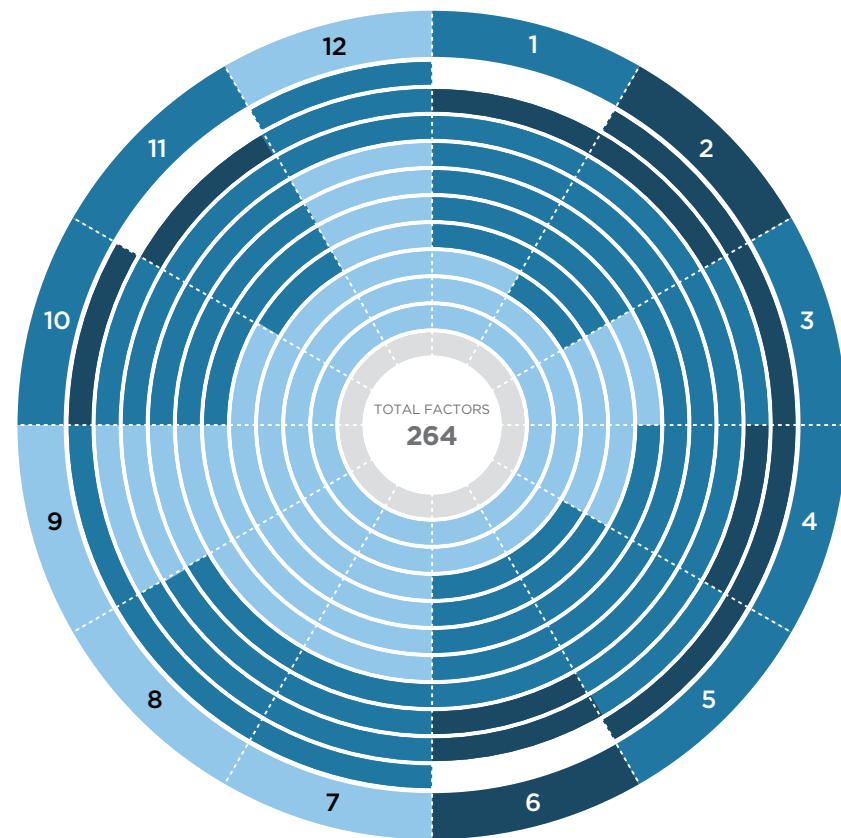
Identifying Key Resilience Themes

100RC's proprietary Perceptions Assessment Tool (PAT) was used to source and analyze the perceptions of city leaders and civil society actors on key resilience strengths and weaknesses. A mixed method approach was used which included expert surveys, working group sessions, and inputs from the Agenda Setting Workshop. One-on-one interviews with city champions helped validate hypotheses on priority strengths and weaknesses. Below, key resilience strengths and weaknesses are discussed.



RESILIENCE THEMES

- 1 MEETS BASIC NEEDS
- 2 SUPPORTS LIVELIHOODS & EMPLOYMENT
- 3 ENSURES PUBLIC HEALTH SERVICES
- 4 PROMOTES COHESIVE & ENGAGED COMMUNITIES
- 5 ENSURES SOCIAL STABILITY, SECURITY & JUSTICE
- 6 FOSTERS ECONOMIC PROSPERITY
- 7 MAINTAINS & ENHANCES PROTECTIVE NATURAL & MANMADE ASSETS
- 8 ENSURES CONTINUITY OF CRITICAL SERVICES
- 9 PROVIDES RELIABLE COMMUNICATION & MOBILITY
- 10 PROMOTES LEADERSHIP & EFFECTIVE MANAGEMENT
- 11 EMPOWERS A BROAD RANGE OF STAKEHOLDERS
- 12 FOSTERS LONG-TERM & INTEGRATED PLANNING

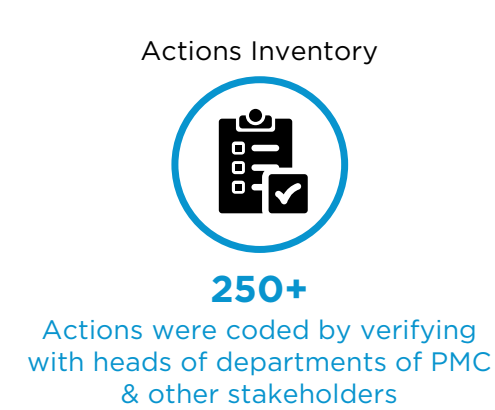


LEGEND ■ Need to do better ■ Doing well, but can improve ■ Area of strength

Figure 38: Perceptions Assessment Tool

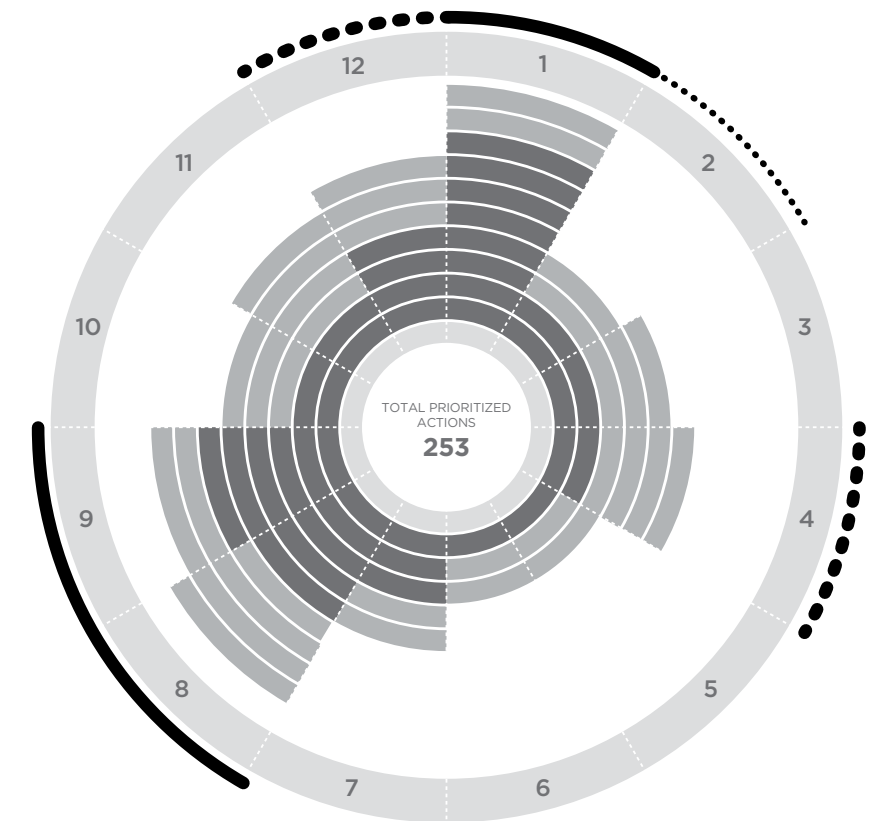
Synthesising Current Resilience Initiatives

250 plus resilience related actions from the year 2005 onwards were sourced from publicly available documents. These were verified with Heads of Departments at the Pune Municipal Corporation and were also checked against municipal budgets (past two years) and confirmed with stakeholders across government, civil society, and academia. The purpose of this activity was to identify actions and gaps in resilience efforts across different drivers of resilience, against evolving priority areas.



RESILIENCE THEMES

- 1 MEETS BASIC NEEDS
- 2 SUPPORTS LIVELIHOODS & EMPLOYMENT
- 3 ENSURES PUBLIC HEALTH SERVICES
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- 11 EMPOWERS A BROAD RANGE OF STAKEHOLDERS
- 12 FOSTERS LONG-TERM & INTEGRATED PLANNING



LEGEND ■ Primary ■ Secondary Areas of: ■ Deep Engagement ●●● Mild Engagement ●●●● Low Engagement

Each segment represents 3.5 action codings

Figure 39: Actions Inventory Tool



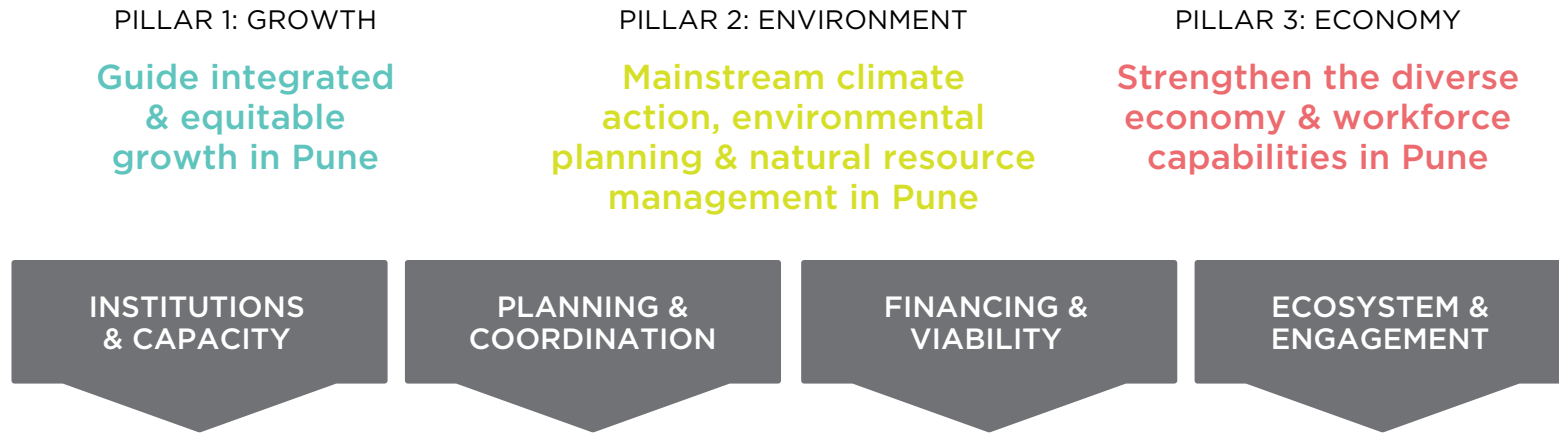
RESILIENCE STRATEGY

Image courtesy: Dan Tassone

Pune Resilience Strategy

Outlines 3 pillars, 10 inter-related goals, and 28 actions, that can be implemented through over 40 projects. These enhance the ongoing work in the city while also proposing new projects.

Resilience Pillars & Visions
Diagnostic Framework

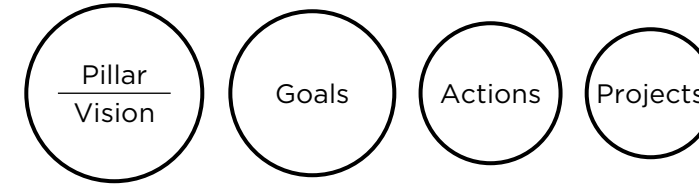


Resilience Goals

- 1.1** Promote integrated development planning in Pune urban region
- 1.2** Strengthen low carbon & shared mobility services in Pune urban region
- 1.3** Ensure access to safe, secure, adequate & affordable housing for all
- 1.4** Strengthen pathways for democratic decision-making & civic participation in local area planning
- 2.1** Enhance environmental governance & community stewardship
- 2.2** Study, monitor & proactively plan for ecosystem benefits
- 2.3** Promote circular economy through waste management
- 3.1** Boost Pune's economy through skilling and support for business
- 3.2** Ensure every individual in Pune has the opportunity to work in dignity
- 3.3** Promote Pune as a centre for innovation by focusing on creativity, research and development

Guide to read the strategy

STRATEGY HEIRARCHY



GOAL NUMBER

Title

Description for why the goal is necessary to build resilience

SDGs met by the goal

ACTION NUMBER

Title

Action Description

Resilience-building projects
Project | Objective | Success Indicators | Resilience Value

Project Title

Lead (Governments, Civil Society, Private Sector, Academic/Research Institution, Individual)

Scale (National/Regional/City/Neighbourhood)

Type (Infrastructure, Program, Campaign, Challenge, Study, Plan, Financing, Policy/Regulation, Event, Entity)

Status (Research, Planning, Delivery) Term (Short, Medium, Long)

GOAL 1.1
Promote integrated development planning in Pune urban region

HOW?
ACTION 1.1.1
Improve processes and capacities for integrated development planning in Pune region
ACTION 1.1.2
Enhance resilience at the regional scale including by mapping environmental assets and integrating conservation objectives into development plans

WHY?
With rapid urbanization, the traditional pace and methods of Development Planning are no longer serving the needs of the city. The need for integrating sectors such as mobility planning, ecosystem conservation, economic development, and re-development of older/core city areas into land-use and development planning is evident, given the desire to enhance resilience in the urban region. The absence of a modern urban planning framework, performance measures of spatial plans, and common digital GIS base map across agencies lead to weak plans, and

SUSTAINABLE DEVELOPMENT GOALS

ACTION 1.1.1
Improve processes and capacities for integrated development planning in Pune region

The Pune metropolitan region has multiple institutional levels and entities undertaking development planning. While each local authority is mandated to prepare its own development plan responding to local-specific needs, stronger mechanisms are needed for synergizing these plans towards enhancing resilience and sustainability at the regional scale. Strategic planning for the urban area by PMRDA and municipal jurisdictions by PMC and PCMC, while also enabling local area plans may be the way forward. Innovative approaches and instruments may also be needed. Transit projects (metro, BRT, High Capacity Mass Transit Road) and addition of peri-urban areas are opportunities for new models of development planning, such as Transit Oriented Development and Local Area Plans. Plan frame-works are also needed to rejuvenate old core, high density areas that have below-par building stocks and services, while conserving heritage precincts and the pre-motorization urban fabric.

Project	Objective	Success Indicators	Resilience Value
Launch a multi-stakeholder Forum of Sustainability Planning to foster innovations Led by PMRDA Regional Program Proposed by Resilient Pune Short-term	To introduce innovations in processes, instruments, and institutional arrangements in the planning process, with concomitant enhancement of the technical capacity and information base of the government agencies and professionals anchoring these processes	<ul style="list-style-type: none"> Participation of the key institutional stakeholders in the Forum Interaction of the Forum with diverse input providers on innovations in planning, and social, environmental and economic aspects Incubation of innovations 	<ul style="list-style-type: none"> Promotes leadership and effective management for resilience planning
Prepare a strategic structure plan for the metropolitan region, integrating various Development Plans identifying resilience indicators at a strategic level Led by PMRDA/PMC Regional Plan New Medium-term	To coordinate the Development Plans of different local authorities and the PMRDA, and enhance integration of resilience at a strategic level in master plans	<ul style="list-style-type: none"> An integrated strategic plan is created Resilience enhancing elements are added to the strategic plan Resilience in the metropolitan region increases over time, captured against the identified resilience indicators 	<ul style="list-style-type: none"> Avoids uncontrolled urban development Avoids infrastructure failure Fosters long-term & integrated planning



PILLAR

1

Guide integrated & equitable growth in Pune

Image courtesy: google.com

As Pune’s population and urban spread increases, three broad spatial patterns emerge – a congested core of historic significance, medium density neighbourhoods that surround the core, and rapidly urbanizing peri-urban areas with governance deficit, witnessing haphazard township developments proximate to large employment centres.

The rapid urbanization following the booming economic opportunities in the region, with no institutions mandated to foresee and predictively plan and monitor these services, have accentuated environmental as well as infrastructural stresses of mobility and affordable housing. For example, there is no single authority or process that oversees the convergence of works by the traffic dept, road dept, public bus & metro mobility services. Similarly housing adequacy is not measured or comprehensively planned for.

The development plans only cover land-use in their scope, and therefore integration of mobility, environment, economic development is overlooked, causing uneven and unsustainable growth. As the 34 surrounding villages get incorporated into PMC over the next few years, nearly doubling its footprint, it is imperative to guide growth and to ensure that the citizen experience across the region is equitable along various development parameters. Enhancing citizen engagement and promoting social cohesion, especially in areas populated with new migrants (both high-income professionals and livelihood-seeking populace) will make these communities more resilient.



GOAL 1.1

Promote integrated development planning in Pune urban region



GOAL 1.2

Strengthen low carbon & shared mobility services in Pune urban region



GOAL 1.3

Ensure access to safe, secure, adequate & affordable housing for all



GOAL 1.4

Strengthen pathways for democratic decision-making & civic participation in local area planning



GOAL 1.1

Promote integrated development planning in Pune urban region

WHY?

With rapid urbanization, the traditional pace and methods of Development Planning are no longer serving the needs of the city. The need for integrating sectors such as mobility planning, ecosystem conservation, economic development, and re-development of older/core city areas into land-use and development planning is evident, given the desire to enhance resilience in the urban region. The absence of a modern urban planning framework, performance measures of spatial plans, and common digital GIS base map across agencies lead to weak plans, and inadequate implementation and enforcement. This results in unregulated growth, destruction or degradation of natural assets, and failure or inadequacy of infrastructure. The city becomes more susceptible to shocks such as extreme weather events. Chronic stresses emerge, exacerbating poverty and disease due to unhealthy environments.

Transit projects (metro, BRT, High Capacity Mass Transit Road) that are underway in Pune provide an opportunity to develop new models of development planning, such

as Transit Oriented Development and Local Area Plans. Guidelines are also needed for re-development of high density areas that have below par building stocks and services, while conserving heritage precincts and the pre-motorization urban fabric. Currently the surrounding villages that are to be integrated into the PMC, will have a separate Development Plan. Thus there is a need for integration of the multiple Development Plans into one 'Strategic Plan' for the entire municipal jurisdiction, while enabling local area plans.

HOW?

ACTION 1.1.1

Improve processes and capacities for integrated development planning in Pune region

ACTION 1.1.2

Enhance resilience at the regional scale including by mapping environmental assets and integrating conservation objectives into development plans

ACTION 1.1.1

Improve processes and capacities for integrated development planning in Pune region

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Transit projects (metro, BRT, High Capacity Mass Transit Road) and addition of peri-urban areas are opportunities for new models of development planning, such as Transit Oriented Development and Local Area Plans. Plan frame-works are also needed to rejuvenate old core, high density areas that have below-par building stocks and services, while conserving heritage precincts and the pre-motorization urban fabric.

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Launch a multi-stakeholder Forum of Sustainability Planning to foster innovations</p> <p><i>Led by PMRDA Regional Program Proposed by Resilient Pune Short-term</i></p>	<p>To introduce innovations in processes, instruments, and institutional arrangements in the planning process, with concomitant enhancement of the technical capacity and information base of the government agencies and professionals anchoring these processes</p>	<ul style="list-style-type: none"> Participation of the key institutional stakeholders in the Forum Interaction of the Forum with diverse input providers on innovations in planning, and social, environmental and economic aspects Incubation of innovations 	<ul style="list-style-type: none"> Promotes leadership and effective management for resilience planning
<p>Prepare a strategic structure plan for the metropolitan region, integrating various Development Plans identifying resilience indicators at a strategic level</p> <p><i>Led by PMRDA/PMC Regional Plan New Medium-term</i></p>	<p>To coordinate the Development Plans of different local authorities and the PMRDA and enhance integration of resilience at a strategic level in master plans</p>	<ul style="list-style-type: none"> An integrated strategic plan is created Resilience enhancing elements are added to the strategic plan Resilience in the metropolitan region increases over time, captured against the identified resilience indicators 	<ul style="list-style-type: none"> Avoids uncontrolled urban development Avoids infrastructure failure Fosters long-term & integrated planning
<p>Develop guidelines for implementation, enforcement and monitoring of Development Plans and their adoption in Pune</p> <p><i>Led by PMC & State Urban Development Dept Local/State-wide Policy/Regulation New Medium-term</i></p>	<p>To support timely and comprehensive implementation of Development Plans, assist in resource mobilization, monitoring, review and public reporting on the progress of DP implementation</p>	<ul style="list-style-type: none"> Adoption of the Development Plan implementation guidelines % implementation of the Development Plan Enhanced transparency in processes of implementation and review 	<ul style="list-style-type: none"> Avoids uncontrolled urban development Avoids infrastructure failure Increases transparency and accountability in development planning
<p>Conduct pilots of LAPs and TOD in a range of typologies of density and land-use, with a participatory approach, including for rejuvenation and conservation of core city precincts</p> <p><i>Led by PMC, Local Planning On-going Medium-term</i></p>	<p>To pilot test the methodologies for Local Area Plan preparation in the 11 villages recently integrated into the municipal area, building upon the socio-economic and physical survey being conducted by Gokhale Institute. Services planning may be done in addition to land-use planning as part of the LAP. MoHUA's scheme for support to pilot LAPs and TP Schemes may be used.</p>	<ul style="list-style-type: none"> Improvement in access to public services as compared to the baseline created through the socio-economic survey by Gokhale Institute 	<ul style="list-style-type: none"> Local Area Plans can promote integrated growth, with potential for locale-specific detail and effective and inclusive public participation Fosters long-term & integrated planning Guards against infrastructure failure

SUSTAINABLE DEVELOPMENT GOALS



ACTION 1.1.2

Enhance resilience at the regional scale including by mapping environmental assets and integrating conservation objectives into development plans

As the largest city in the metropolitan region, Pune impacts the region; conversely, a large population within Pune will be impacted by regional-scale developments and changes. It is in the interest of all local self-governments (PMC, PCMC and towns and villages in the region) to be aware of resilience challenges and take steps to enhance resilience at the regional scale. PMC as an important stakeholder can advocate improved natural resource conservation, especially water and biodiversity, integrated land-use and mobility planning, as well as help enhance appropriate economic growth in the region.

A key strategy to do this is to map natural/near natural lands/ ecosystems and other environmental assets and maintain such information as part of the Geographic Information Systems of planning authorities for consideration in planning processes.

Pilot projects may be initiated with a view of securing natural resources through instruments such as Payment for Ecosystem Services (PES), conservation easements and Transfer of Development Rights. The feasibility of these instruments, within the current planning legislative framework, needs to be assessed.

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Study and report on resilience of Pune city within the metropolitan region for integration by PMRDA into its plans</p> <p><i>Led by PMC Regional Program/Study Proposed by Resilient Pune Medium-term</i></p>	To prepare a resilience assessment at the regional scale, using the methodology and learnings from the 100RC program implementation in Pune	<ul style="list-style-type: none"> A resilience assessment is prepared for the Pune metropolitan region 	<ul style="list-style-type: none"> It enhances resilience thinking and provides baselines for future work on resilience enhancement at the regional scale
<p>Ecosystem & Environmental Assets Mapping and integration with DC Rules</p> <p><i>Led by PMC and PMRDA City-wide Program/regulation Proposed by Resilient Pune Medium-term</i></p>	To map and secure natural resources using positive/negative incentives through DC Rules	<ul style="list-style-type: none"> Comprehensiveness of mapping Level of integration of ecosystem and environmental assets 	<ul style="list-style-type: none"> Helps develop robustness in current city development regulatory system
<p>PES-Pay: Study feasibility of conservation easements and application of Payment for Ecosystem Services in PMRDA region (pilot projects, consultations)</p> <p><i>Led by PMC and PMRDA Regional Program/regulation Proposed by Resilient Pune Medium/ long -term</i></p>	To initiate pilot projects to protect natural resources and ecosystem services for the city through instruments such as Payment for Ecosystem Services (PES) and conservation easements, making sustainable natural resource use practices economically viable for communities dependent upon ecosystems for their livelihoods; and to assess the feasibility of these instruments within the current planning legislative framework	<ul style="list-style-type: none"> Number of farmers adopting/ area under sustainable agriculture practices in PMRDA region Number of private and commons forest/natural ecosystem areas brought under conservation regime in PMRDA region Number of sacred groves, commons land conserved and maintained Number of private property owners opting for maintaining properties as 'in-violate' areas in accordance with green and blue zone mandate 	<ul style="list-style-type: none"> Ensures continuity of critical ecosystem services Ensures social stability, security and justice It fosters long-term and integrative planning It helps creates cohesiveness and belongingness among different communities PMRDA region



GOAL 1.2

Strengthen low carbon & shared mobility services in Pune urban region

WHY?

Rapid increases in the urban area and population, and the inability of transportation planning and service provision to keep pace, have generally been seen as the reason for the increase in private motorized modes of passenger transport. The adverse impacts of this trend include increased road crashes and fatalities, increased health impacts from air pollution and driving stress, time wasted in congestion and increased contribution to climate change. The National Urban Transport Policy, 2006, lays the direction for improvements in this sector. The PMRDA, PMC and PCMC have also taken up projects for improvement, such as Pune Metro, Rainbow BRTS, the Comprehensive Bicycle Master Plan, and the Pune Streets Projects. However, critical gaps in institutional structures, coordination, and understanding are preventing and/or delaying the transition to sustainable mobility in Pune.

HOW?

ACTION 1.2.1

Enhance institutional capacity and coordination for mobility planning at PMC and for the Pune Urban Agglomeration (UA)

ACTION 1.2.2

Improve bus-based public transit

ACTION 1.2.3

Integrate and improve para-transit and shuttle operations for last mile and local area shared mobility

ACTION 1.2.4

Improve facilities for pedestrians and cyclists

ACTION 1.2.5

Institute a comprehensive public engagement program on sustainable mobility

SUSTAINABLE DEVELOPMENT GOALS



ACTION 1.2.1

Enhance institutional capacity and coordination for mobility planning at PMC and for the Pune Urban Agglomeration (UA)

The PMRDA, PMC, PCMC, PMPML, Traffic Police and RTO have a role in transportation planning, infrastructure, service provision and regulation, and they have taken up transportation improvements. These include preparation of mobility plans, infrastructure for metro, BRTS, ‘complete streets’ projects, public bicycling, etc.

However, critical gaps in institutional structures, coordination, and understanding are preventing and/or delaying the

transition to sustainable mobility in Pune. It is essential that all government agencies linked to mobility planning, infrastructure development and service delivery in Pune have a comprehensive and coherent approach with adequate institutional and technical capacities.

Leads: Municipal Commissioners PMC & PCMC; CEO PMRDA, District Collector, Maha Metro, PMPML, RTO, Traffic Police

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Set up a Mobility Department within PMC <i>Led by PMC</i> <i>City-wide Entity</i> <i>Proposed by Resilient Pune Short-term</i>	To bring various elements of mobility planning and infrastructure development under one entity within PMC This will remove conflicting mandates of different departments/modes of transport, and create a common vision for enhancing sustainable mobility systems in Pune city.	<ul style="list-style-type: none"> Improved implementation of the Comprehensive Mobility Plan, Pune Streets Program, Bicycle Plan, Parking policy and other mobility projects Reduced road crashes and fatalities Reduced tail pipe emissions 	<ul style="list-style-type: none"> Creates an environment that fosters integrated and sustainable mobility planning and regulation at the city-wide scale
Update the Comprehensive Mobility Plan (CMP) of PMC, including its links with the CMP of PMRDA <i>Led by PMC</i> <i>Local Planning</i> <i>On-going Short-term</i>	To review the changes in the mobility scenario in Pune city and the metropolitan region, including metro, BRT, aggregator cabs, bicycle plans, street design projects, pedestrian policy, parking policy within the city, as well as the proposals and projections in the CMP prepared by the PMRDA	<ul style="list-style-type: none"> Updated targets for sustainable mobility provisioning, budget estimates and detailed action plans available for implementation 	<ul style="list-style-type: none"> Improves access to sustainable mobility Reduces loss of life and property Reduces environmental degradation and pollution
Set up a Pune Unified Metropolitan Authority (PUMTA) for Pune UA <i>Led by PMRDA</i> <i>Regional Entity</i> <i>On-going</i>	To ensure coordinated planning and implementation of sustainable mobility infrastructure and services with multi-modal integration across the metropolitan region	<ul style="list-style-type: none"> Integrated land-use and transport planning at the regional scale Improved access to public transport at the regional scale Reduced road crashes and fatalities at the regional scale 	<ul style="list-style-type: none"> Creates an environment that fosters integrated and sustainable mobility planning and regulation at the regional scale

ACTION 1.2.2

Improve bus-based public transit

Bus-based public transit is the backbone of the public transportation system in the Pune region, providing affordable mobility through an extensive network operated by the Pune Mahanagar Mahamandal Ltd (PMPML). However, the quality of bus-based transit services has declined tremendously in recent years due to lack of adequate funding from the primary stakeholders (PMC and PCMC). This is exacerbated by inadequate allocation of land parcels for bus depots/ parking and workshops, and weak regulation through

the Regional Transport Authority. Repeated leadership changes, lack of long-term strategic planning mechanisms, and a near absence of public engagement are institutional challenges. Improvements are needed through actions external to the PMPML (such as investment, land-use planning linkages, regulation) as well as internal to PMPML (technical capacity, management, public engagement).

Leads: PMC, PCMC, PMPML

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Establish service levels for bus-based public transit <i>Led by PMPML</i> <i>City-wide Plan</i> <i>Proposed by Resilient Pune Medium-term</i>	To set up a transparent, participative and accountable mechanism for establishing service levels for bus-based public transport	<ul style="list-style-type: none"> Publication of service levels, and considerations in establishing these Inclusivity, clarity of information materials on service levels and trade-offs, deliberative quality, and influence of the process of public engagement on decision-making about service levels, assessed by participants/public 	<ul style="list-style-type: none"> Fosters greater accountability in public bus service by enabling it's monitoring and evaluation
Strengthen integration of bus-based public transit in land-use plans <i>Led by PMRDA, PMC, PCMC</i> <i>Local, regional Plan</i> <i>On-going</i>	To ensure that Development Plans integrate and support sustainable transport infrastructure creation and planning, through regular review and update of the Development Plans from a public transport planning perspective	<ul style="list-style-type: none"> Adequacy of land and infrastructure needed for public transport Improvements in access to public transport as DPs get implemented Adequate ridership of public transport, as DPs get implemented 	<ul style="list-style-type: none"> Helps avoid a concomitant rise in private motorized modes, related road safety concerns, air and noise pollution
Continue preparation of the PMPML Business Plan to strengthen institutional structure, management and technical capacity of PMPML <i>Led by PMPML, PMC</i> <i>Local Plan</i> <i>On-going</i>	To review institutional capacity and operations of the PMPML, and develop a plan of action for strengthening the same, vis a vis organizational vision and structure, human resources, finances and assets, operations plan, etc., including the plan for transition/change management	<ul style="list-style-type: none"> Clarity of ways forward for strengthening PMPML Traction with/acceptance among key institutional stakeholders about the recommendations of the Business Plan 	<ul style="list-style-type: none"> Strengthens institutional structure, management and technical capacity of PMPML and in turn increases bus use
Enhance investment in, and incomes of PMPML <i>Led by PMC and PMPML</i> <i>Local Plan</i> <i>On-going Medium-term</i>	To develop and implement a range of options to ensure the financial stability of PMPML, such that it can provide high quality, affordable and inclusive public transport services in Pune, responding to agreed upon service levels	<ul style="list-style-type: none"> Availability of adequate capital and operating funds through improved routes leading to greater ridership and farebox revenue, rationalised advertising, special bus hire services, property rentals, savings from more efficient services, bonds, etc. Regular payments to staff and vendors 	<ul style="list-style-type: none"> High quality and affordable public transport services are provided in a stable manner, with expansion of services as per need
Strengthen regulation of PMPML through the RTA <i>Led by State Government Transport Dept</i> <i>State Regulation</i> <i>On-going</i>	To improve the performance of PMPML through appropriate, functional regulatory mechanisms including regular public disclosure and hearings	<ul style="list-style-type: none"> Improvements in performance over time, captured by public and customer satisfaction, affordability of services, and improvement in redressal of internal and external grievances 	<ul style="list-style-type: none"> Despite having a monopoly in stage carriage services, PMPML as a public utility, provides a reasonable level of public transportation services at a fair price within the Pune region

ACTION 1.2.3

Integrate and improve para-transit and shuttle operations for last mile and local area shared mobility

Short local trips currently made by private motorized modes could be converted to shared modes, with local circulator services. This would help create a more conducive environment for on-street parking demand management, which if implemented, would help free up street space for pedestrians and cyclists.

Para-transit providers are primarily in the informal sector, such

as share-rickshaws and six-seater services. Better integration of these informal services into the PMC's mobility plans will help improve shared transport services in areas under-served by public transport, for local circulator services and as last mile connectivity.

Leads: RTO, Traffic Police, Auto rickshaw unions/associations, PMC

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Institutional arrangement for running shuttle services <i>Led by PMC/RTO/PMPML/Rickshaw Unions</i> <i>City-wide Program</i>	To develop an institutional mechanism enabling local circulator services	<ul style="list-style-type: none"> Shift of private motorized trips to shared modes Reduction in parking demand of private vehicles used for local trips 	<ul style="list-style-type: none"> Increased shared mobility services can help avoid trips by private motorized modes, thereby helping reduce emissions, and road space usage for on-street parking
Institute pilot shuttle services Proposed by Resilient Pune Medium-term <i>Led by PMC/RTO/PMPML</i> <i>Local Project</i> <i>New Short-term</i>	To conduct a trial of a shuttle service, and document the process and impacts, for potential policy development and scale up	<ul style="list-style-type: none"> Shift of private motorized trips to shared modes Reduction in parking demand of private vehicles used for local trips The operation of shuttle services is seen as an attractive business opportunity, including by informal IPT operators 	<ul style="list-style-type: none"> Increased shared mobility services can help avoid trips by private motorized modes, thereby helping reduce emissions, and road space usage for on-street parking Improved livelihood option for current informal IPT operators

ACTION 1.2.4

Improve facilities for pedestrians and cyclists

Facilities for walking designed with universal access principles, cycling or non-motorized transport are essential elements in any city. PMC has already formulated a Pedestrian Policy, a Parking Policy, developed Urban Street Design Guidelines, and a Comprehensive Bicycle Master Plan. Implementation of the Pune Streets Program is underway, through which about 100 kms are to be developed as 'complete streets'.

These projects need to be continued and supported. As non-motorized transportation planning and infrastructure

development are relatively new areas of work in India, it is important to enhance institutional and technical capacity at the PMC to effectively implement these new initiatives.

Civil society engagement is also essential to effect a transition in street design and usage. For this, a multi-stakeholder partnership could be devised with options for corporate groups, commercial associations, educational institutions, etc., to join.

Leads: PMC Road Dept, Traffic Dept, Bicycle Dept

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Continue Pune Streets Program and Pune Cycle Plan <i>Led by PMC</i> <i>City-wide Program</i> <i>On-going Medium-term</i>	To develop complete streets, with universal access design, that cater to all user groups, including wide and continuous footpaths, safe pedestrian crossings, separate cycle tracks where applicable, conveniently placed bus stops, clearly designated on-street parking, organised street vending and properly-scaled carriageways, and implement the cycle network as proposed in the Pune Cycle Plan	<ul style="list-style-type: none"> Number of kms of complete streets, especially key arterial and sub-arterial roads, where the Pune Streets Program is implemented (100 kms is the initial target) Number of kms of completion of cycle network and setting up of cycle parking facilities 	<ul style="list-style-type: none"> Safe, convenient and attractive streets are the first and most basic element of sustainable mobility infrastructure and the most accessible public spaces across the city
Conduct technical training on NMT planning <i>Led by PMC</i> <i>Local Capacity building</i> <i>New Short-term</i>	To enhance technical capacity of PMC staff in Traffic, Road and related line departments on non-motorized transportation planning, development and review, and develop appropriate organizational procedures for the same	<ul style="list-style-type: none"> Development of appropriate institutional capacity and processes to undertake NMT planning, development and review 	<ul style="list-style-type: none"> Adequate institutional capacity is essential to develop inclusive and complete streets infrastructure, which directly enhances public well-being
Initiate Bicycle Partnership for cycling promotion <i>Led by PMC/Bicycle Advisory Committee</i> <i>National Study</i> <i>On-going</i>	To set up a PPP mechanism with the PMC to enable corporate partnerships, and support through funding/CSR, employee engagement and in kind, for promotion of bicycling in Pune	<ul style="list-style-type: none"> An effective mechanism is set up that enables interested entities to join and support bicycling The mechanism enables effective outreach management to the public and various stakeholders, as per the Pune Cycle Plan 	<ul style="list-style-type: none"> To create an environment that fosters partnerships and engagement in promotion of bicycling in Pune

ACTION 1.2.5

Institute a comprehensive public engagement program on sustainable mobility

While PMC has taken steps for strengthening mobility services, lack of public understanding and support delays the transition to a sustainable mobility system in Pune. Protection of pedestrian and cyclist facilities, acceptance of parking regulations, and the shift to more sustainable modes requires public support. Equally, public engagement is needed for local refinement of new physical infrastructure and services being put in place.

Improved public understanding and engagement can be the

leverage that will result in better physical designs and systems, as well as exert pressure on political and administrative systems. It may be the most enduring approach to enable the transition and future sustainability.

Concomitantly, adequate institutional capacity to undertake public engagement, and actual processes to inform and engage the public, would enable a smoother and more rapid system transition.

Leads: PMC

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Strengthen PMC's capacity for IEC and public engagement on sustainable mobility</p> <p><i>Led by PMC City-wide Program Proposed by Resilient Pune Short-term</i></p>	<p>To set up mechanisms and build up institutional capacity at PMC for facilitating interaction and engagement between the local government, transport service providers, passengers and the general public, about transportation policies, systems and infrastructure</p>	<ul style="list-style-type: none"> Orientation is carried out for PMC staff related to transportation planning, on the need for and methods of IEC and public engagement for the sector A policy and procedures are developed for conduct and assessment of IEC, marketing, and public engagement processes and events The PMC is able to anchor high quality public engagements and contracts for such services 	<ul style="list-style-type: none"> Enables better and more informed decision-making about transportation policies and systems, that are sustainable, supportable, reflect community values and help in smooth implementation of plans and projects
<p>Implement sustainable mobility communication campaign</p> <p><i>Led by PMC City-wide Program Proposed by Resilient Pune Short-term</i></p>	<p>To implement an extensive public outreach campaign about PMC's sustainable mobility efforts, including public engagement around specific projects currently underway (such as the Rainbow BRT, Pune Streets Program, Pune Cycle Plan) or soon to be taken up (such as implementation of the Parking Policy)</p>	<ul style="list-style-type: none"> Improved public understanding about sustainable transportation, and greater credibility of PMC and associated agencies, assessed through public perception surveys and other tools Improved ownership and engagement of communities of sustainable transport projects Public engagement is Inclusive, well-informed with high deliberative value, and enables real influence of the public in decisions, assessed through participant feedback, independent oversight committees, etc. 	<ul style="list-style-type: none"> Enables better and more informed decision-making about transportation policies and systems, that are sustainable, supportable, reflect community values and help in smooth implementation of plans and projects



GOAL 1.3

Ensure access to safe, secure, adequate & affordable housing for all

HOW?

ACTION 1.3.1

Incentivize private sector participation in responding responsibly to well-connected, low-income housing construction and upgradation

ACTION 1.3.2

Reduce housing vacancies and create a vibrant, sustainable, and inclusive rental housing market

WHY?

Housing policies seem to have focused on the construction of new units with little impact on reducing housing vacancy of 20-25%. Not just this, policies have also not been able to address the supply-demand mismatch, especially in low-income housing segments, showing the inability of the current market mechanisms to bridge the gap. These have been especially difficult to assess, plan, and monitor with no single authority mandated to oversee housing in the urban region and limited data for the market to make relevant products. These challenges are further expected to exacerbate with the incorporation of additional villages and doubling of the jurisdiction area under the PMC.

SUSTAINABLE DEVELOPMENT GOALS



ACTION 1.3.1

Incentivize private sector participation in responding responsibly to well-connected, low-income housing construction and upgradation

In Pune, low-income housing drives nearly 75% of the housing demand but only about 4% of the supply; with majority of the supply directed towards the middle-income group. Almost 90% of the local housing stock in Indian cities is met by local developers. However, private developers have traditionally not able to meet the low-income housing demands because of limited availability of low cost developable land in the city, long government approval processes that drive up interest on borrowed capital, high stamp duty and registration costs, limited access to finance for small developers, and poor professional management of their businesses.

Recent reforms like the introduction of Maharashtra Real Estate Regulation and Development Act (MahaRERA), infrastructure status accorded to affordable housing, lower interest rates and reduction of Goods and Services Tax (GST) rate for affordable homes, new PPP policies to incentivize private land for affordable housing, and the various delivery models under PMAY Urban are encouraging the real estate

and banking sectors to meet the low-cost housing demand. Rise in affordable housing finance companies backed by the National Housing Bank and affordable housing fund is improving access to finance for beneficiaries. Though, more can be done here to ensure identification of correct beneficiaries, increase outreach through micro mortgage financing mechanisms and self-help groups (SHGs), and flexible repayment mechanisms for loans to cater to variable income flows.

The local government in Pune needs to ensure housing supply is met through inclusive housing policies while developing transit-oriented development, earmarking land for low-cost housing in the development plans, and ensuring building permissions for quality, and well-connected, low-cost housing is fast-tracked with transparency and accountability from developers.

Leads: PMC Building Dept, Brick Eagle, Mashaal, and Shelter Associates

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Create transparency in PMC's 'Building Permission Online Services' and create a transparent, single-window clearance for affordable housing projects</p> <p><i>Led by PMC Building Development Dept. and MahaRERA City-wide Regulation On-going Short-term</i></p>	To make all building permissions available online, making tracking easier and to avoid illegal construction. This should be combined with creating a single-window clearance for affordable housing so that developers get approval quickly, reducing project time & costs	<ul style="list-style-type: none"> Number of low-income housing projects sanctioned Time taken for sanctions/number of approval stages 	<ul style="list-style-type: none"> Improves access by reducing cost incurred by delays in approval Improves transparency and accountability of developers and the PMC Building Dept.
<p>Incentivize low-income housing, esp. in the development plan of newly incorporated villages and TOD zones</p> <p><i>Led by PMC Development Plan Cell City-wide Plan On-going Short-term</i></p>	To increase supply of quality low-income housing units while also ensuring their connection to civic amenities and infrastructure like public transport	<ul style="list-style-type: none"> % of residential land earmarked for well-connected low-income housing Policy instruments like tax incentives, increased FSIs, etc. Housing cooperatives or community land trusts owned low-income housing (maintains affordability) 	<ul style="list-style-type: none"> Ensures transport spending per household is reduced by building housing close to transit Improves quality of life for low-income households Increases savings for spending on education, food, etc., by ensuring housing plus transport cost is lower than 45% of household income
<p>Nurture and professionalize real estate entrepreneurs and small developers</p> <p><i>Led by Brick Eagle National Program On-going Medium-term</i></p>	To improve market-based solutions to housing by supporting small developers and real estate entrepreneurs with access to capital, access to construction knowhow, new technology, sales and advertising, go-to market strategies, and any other needs they might have	<ul style="list-style-type: none"> Number of early-stage developers that have received support and grown Innovations in construction techniques/building materials that are piloted and scaled in Pune 	<ul style="list-style-type: none"> Nurtures innovation in the housing and real estate sector Supports local entrepreneurs to solve local challenges
<p>Build capacity of slum-dwellers</p> <p><i>Led by Local NGOs City-wide Program Proposed by Resilient Pune Medium-term</i></p>	To train slum-dwellers on their entitlement rights, conduct simple on-site tests in building construction, and train them on negotiation techniques so that they are able to monitor construction/upgradation of their houses, and demand/negotiate their rights with adequate knowledge	<ul style="list-style-type: none"> Trainings conducted with % slum-dwellers, especially before a potential resettlement/redevelopment or upgradation 	<ul style="list-style-type: none"> Instills confidence within slum-dwellers and puts them in the driver's seat

ACTION 1.3.2

Reduce housing vacancies and create a vibrant, sustainable, and inclusive rental housing market

Between 20-25% of 2011 residential census housing in Pune was lying vacant. A large percentage of this is attributed to investor housing bought for capital appreciation rather than rental income. Rental yields in India are not lucrative enough, averaging at 2-4%, much lower than global averages as per IDFC Institute's analysis. Returns are also lower than the more secure government bonds in India. In addition, further challenges in enforcing contracts that do not protect landlords adequately, and long and expensive judiciary processes in case of conflict, dissuade investments in the rental market.

But there is great merit in developing a healthy rental

ecosystem given Pune's large populace of students, young professionals, and migrant workers. For low-income households that often work in the informal sector, rental housing better suits their income volatility and risk profile. Thus it is access to housing, not ownership, that is of primary importance. To bring the vast available stock of vacant housing into the rental market, there is considerable space for the emergence of rental management companies (RMCs) that can professionally manage and rent out properties on behalf of the owners. This will be possible if policy measures create an enabling environment.

Leads: PMC, CREDAI, IDFC Institute and Niti Aayog

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Incentivize providers of low-cost rental housing and nurture rental management companies</p> <p><i>Led by PMRDA/PMC/CREDAI Region Regulation/Policy On-going Medium-term</i></p>	To promote private sector-led low-cost rental accommodation, especially for low-income migrant workers, and students. Potential models may include land being leased from the government, developed by builders, and operated by private rental management companies	<ul style="list-style-type: none"> Unutilised government-owned land in city centres leased to private developers partnering with providers of low-cost rental homes at affordable rates Infrastructure status accorded to such constructions so that private developers are able to leverage lower cost of borrowing, tax breaks as well as access to capital Grants offered to private developers under PMAY AHP programme is extended to stakeholders operating in the affordable rental housing segment Relaxed FSI for hostels in Pune development control regulations (DCR) Reduced/waived trade license fee for hostels and paying guest accommodations, allowing them to pay residential rates for power supply, water, and other municipal services 	<ul style="list-style-type: none"> Provides affordable avenues of residence to migrant workers, students, and job-seekers, whether seasonal or longterm Shifts the role of the government from a provider to a facilitator of affordable housing
<p>Levy a Vacancy Tax</p> <p><i>Led by NITI Aayog National Study On-going Medium-term</i></p>	To assess business regulations and enabling environment across India from the perspective of firms across states, sectors, and enterprise types	<ul style="list-style-type: none"> Improvements in performance over time, captured by ease of doing business indicators (Infrastructure/ utilities, access to capital) 	<ul style="list-style-type: none"> Creates an environment that fosters globally competitive firms, capable of driving and sustaining economic growth



GOAL 1.4

Strengthen pathways for democratic decision-making & civic participation in local area planning

WHY?

The rapid pace of urbanization poses challenges for governance. Aspects such as societal heterogeneity, structural inequalities, varied literacy levels add to the complexity of urban sustainability issues. While rural areas in India have the 'gram sabha', there is no analogous institution in cities, where citizens can participate in civic matters in their neighbourhoods. This impacts not just accountability of municipalities, but quality of democracy itself. Low levels of transparency in finances and operations of municipalities worsens this problem.

It is recognized that public participation in cities must improve, e.g. urban planning guidelines by Govt of India mention the need for public participation (URDPFI 2015). A provision for Area Sabhas was added to the Maharashtra Municipal Act in 2009, but not implemented as rules have not been made. In addition, Public Disclosure Law is not implemented in spirit despite being enacted. The lack of well-structured public engagement and participation

processes impedes problem analysis, search for alternatives and innovations, and implementing solutions.

Innovations are needed in processes of public engagement and participation in civic matters to help harness the wisdom of the public, improve trust and enable collaborative problem solving, be especially responsive to the needs of vulnerable and marginalized groups, and enhance well-being.

HOW?

ACTION 1.4.1

Institute policies and undertake capacity building at PMC for inclusive local area participatory planning and public engagement

ACTION 1.4.1

Institute policies and undertake capacity building at PMC for inclusive local area participatory planning and public engagement

Public participation is important for urban sustainability and effective governance. However, there is no policy or guideline adopted about why, when and how public engagement may be done as part of civic public governance. In the absence of a policy, good practice guidelines, and standards, the efforts made for public participation often fall short, leading to under-alignment between program goals and citizen needs, and greater mistrust of the government by the public.

The ambition of instituting participatory processes must be accompanied with some effort on capacity building to anchor and conduct participatory processes in an inclusive, thoughtful and effective manner. This will include supportive administration, trained facilitators and civic or public capacity to contribute as informed participants.

Lead: PMC

ACTION 1.4.2

Undertake pilots of public engagement processes for ward/neighbourhood level planning and implementation

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Prepare a policy for sectoral and area-based public engagement <i>Led by PMC</i> <i>City-wide Program</i> <i>Proposed by Resilient Pune Short-term</i>	To develop a policy for sectoral and area-based public engagement for placement before the PMC General Body, potentially through an extensive process of dialogue and engagement with the public, elected representatives, academics, government functionaries and other experts	<ul style="list-style-type: none"> The policy clarifies how public engagement fits within the existing democratic institution, as a way of deepening democratic governance Includes principles of and measures for inclusivity, deliberative quality, and influence of public engagement on civic decision-making, and their assessment The scope of public engagement includes stages of policy formulation, program development, budgeting, implementation and review, as appropriate The policy sets out mechanisms for implementation and addresses barriers to public engagement 	<ul style="list-style-type: none"> Enhances social cohesion, inclusion, mutual support, and helps develop more robust, acceptable and implementable policies and programs
Develop guidelines for public infrastructure and services planning in Pune <i>Led by PMC</i> <i>City-wide Guidelines</i> <i>Proposed by Resilient Pune Short-term</i>	To create guidelines for public infrastructure and services planning, based on CPHEEO guidelines and URDPFI guidelines, customized for Pune	<ul style="list-style-type: none"> The guidelines are useful for municipal officials in line departments and ward offices to prepare plans and budgets The guidelines are in line with CPHEEO and URDPFI, and locally relevant The guidelines help to address gaps in infrastructure and services, while also avoiding duplication of proposals 	<ul style="list-style-type: none"> Adequate public infrastructure for shelter, education, mobility and healthcare is the basis of urban well-being Clarity about norms and priorities for public infrastructure and services, localized for Pune's requirements, would help ward offices/line departments use municipal resources more effectively
Conduct training on local area planning and public engagement for municipal staff <i>Led by PMC</i> <i>Local Capacity</i> <i>New Short-term</i>	To conduct orientation programs on local area planning and public engagement for municipal officials, facilitators, the public, youth	<ul style="list-style-type: none"> Participants feedback Participants are able to integrate local area planning and public engagement processes in their work 	<ul style="list-style-type: none"> Improved technical understanding of local area planning and public engagement would help ward offices and line departments deliver more robust, integrated and inclusive services and infrastructure
Develop a manual on good practices for public engagement <i>Led by NITI Aayog</i> <i>National Study</i> <i>On-going</i>	Using the experience from local pilots, as well as public engagement and deliberation processes from other cities, develop and adopt a good practice manual on public engagement for use by PMC and other public authorities	<ul style="list-style-type: none"> Improved conduct of participatory processes 	<ul style="list-style-type: none"> More inclusive, integrated and reflective governance

SUSTAINABLE DEVELOPMENT GOALS



ACTION 1.4.2

Undertake pilots of public engagement processes for ward/neighbourhood level planning and implementation

Formal forums such as an Area Sabha, analogous to the 'gram sabha', are needed to enable participation. These are envisaged under the Maharashtra Municipal Corporations Act, but not yet operationalized.

Pilot projects will help develop and refine methods of inclusive and effective public engagement in the urban context. The role of Area Sabhas is to deliberate on civic issues and engage with corporators and the civic administration, be informed about plans and budgets for local area, provide inputs and suggestions for plans and projects in local area, raise issues and ensure timely redress of various grievances and increase

accountability of corporator and civic administration.

PMC already has e-governance systems and is using ICT tools for public outreach and complaints management. The experiences with participatory approaches shows that the higher populations and densities of urban areas would require innovation in ICT tools, which could support meaningful participation. Such efforts to strengthen structured, inclusive, effective forums and mechanisms for public participation would help improve social cohesion and build resilient societies.

Leads: PMC Ward Offices and sectoral committees

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Constitute pilot Area Sabhas in selected wards as structures for deliberative, democratic public engagement</p> <p><i>Led by PMC Local Project Proposed by Resilient Pune Short-term</i></p>	To constitute pilots of Area Sabhas in selected wards in Pune, as structures to enable deliberative, democratic public engagement, and provide learnings for implementation of the provision for Area Sabhas, which is already included in the Maharashtra Municipal Corporations Act	<ul style="list-style-type: none"> Process documentation is available Provides learnings about the scope, methods, barriers, risks, benefits, resource requirements, capacity needs, readiness and conditionalities for full-scale implementation in a city Builds willingness to implement 	<ul style="list-style-type: none"> Enhances social cohesion, inclusion, mutual support, and helps develop more robust, acceptable and implementable policies and programs
<p>Conduct pilots of ward or area level, and thematic public participatory planning processes and events, building upon existing Annual Citizens' Budget process in Pune</p> <p><i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i></p>	To conduct and evaluate thematic and area level public deliberations, linking to the SDG framework where appropriate, linked to the municipal budget on selected themes, and selected (pilot) wards or neighbourhoods	<ul style="list-style-type: none"> Public inputs are integrated into civic decision-making on area and thematic plans Budgets are allocated for implementation of recommendations arrived at through participatory planning processes Improved access to amenities and services Improved citizen satisfaction levels with participatory processes 	<ul style="list-style-type: none"> Inclusive program formulation, budget allocations, greater accountability and increased social cohesion
<p>Strengthen ICT for public engagement and Social Accountability</p> <p><i>Led by PMC Local/city wide Project Proposed by Resilient Pune Short-term</i></p>	Enhance development and use of ICT tools for Public Engagement and Social Accountability processes. This may be done through hackathons to address needs of information provision, information generation through crowd sourcing and citizen science, and needs for online collaboration and participatory decision-making	<ul style="list-style-type: none"> Ease of use of ICT tools by all segments of society Improved efficiency and quality of public engagement and social accountability processes 	<ul style="list-style-type: none"> Improvements in social accountability and public engagement processes can lead to more a inclusive and cohesive society

ACTION 1.4.3

Improve voter turnout to make electoral outcomes more representative of wider city population

The long history of social movements and the high degree of decentralization and devolution due to the 74th Constitutional Amendment Act (CAA) as implemented by Maharashtra state, has led to PMC's representative democratic institution to be among the strongest in the country. In recent years, the average voter turnout in election is declining, which undermines representation and democracy. The reasons include high levels of migration and difficulty in registration in electoral rolls. There is also erosion of trust that individual votes make a difference, and low visibility of progress of civic works. Studies show that non-participation in elections is higher among marginalized migrant communities, as well as youth from higher income groups. Participation in Municipal elections is lower compared to state and national election, with wards that are further away from city core showing

lower turnout. This spatial variance is attributed to low PMC engagement and service levels in these areas.

In order to improve democratic outcomes, not only is it important to update electoral rolls, but also enhanced civic engagement and encouragement for the exercise of citizenship and franchise. Projects to support the PMC Election Dept in regular and ongoing updation of electoral rolls, and campaigns to encourage people to register, especially among marginalized groups are recommended. Simultaneously, outreach to different types of rare and intermittent voters, especially youth, can help improve voter turnout and democratic outcomes.

Lead: PMC Election Department, PMC Ward Offices

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Permanent online kiosks for voter registration</p> <p><i>Led by State Government/District Administration City-wide Program Proposed by Resilient Pune Medium-term</i></p>	To improve electoral rolls accuracy and updation by providing easy and accessible mechanisms for voter registration	<ul style="list-style-type: none"> Reduction in number of people left out of the electoral rolls Ease of registration, through citizens' feedback/feedback of users of the kiosks 	<ul style="list-style-type: none"> Enhances understanding about voter rights and responsibilities, improves participation in elections, and creates more responsive democratic systems
<p>Institute a role and service linked performance report card for corporators that can be tracked</p> <p><i>City-wide/Program Proposed by Resilient Pune Medium-term</i></p>	To strengthen the connect between local elected representatives and the public and enhance social accountability	<ul style="list-style-type: none"> Improved service delivery and public satisfaction Greater recognition among the public of the role of corporators 	<ul style="list-style-type: none"> Promotes cohesive and engaged communities, sense of local identity, social relationships and citizens interaction



PILLAR
2

Mainstream climate action, environmental planning & natural resource management in Pune

Image courtesy: google.com

Valued for its climate and access to natural environment, Pune has been experiencing severe degradation of its ecological resources. Ecosystem benefits are often considered extraneous and devalued in development planning and infrastructure creation. Degradation or destruction of the natural environment, as well as introduction of invasive alien elements, can result in exacerbation of extreme weather events, flash floods, landslides and spread of disease. Further, sections of the urban poor population, and certain migrant communities, have direct dependencies on natural resources.

The overarching issue is to mainstream environmental thinking within the governments in the Pune metropolitan region. The focus is currently on compliance with environmental standards, and instead needs to be proactive environmental planning that recognizes the role natural assets play in making the city resilient, and the lives of people safer, healthier and enriched.

The objective of this pillar is on solutions that broadly institutionalize environmental planning while building capacities across departments within the PMC, and in the PMR, to better manage the natural resources in the city. The knowledge, capacities and efforts of different civil society and community groups are valuable resources to enhance environmental planning and conservation. Enabling structures and processes to enhance public participation in environment conservation are also a focus of this pillar, that intersects with pillar 1.



GOAL 2.1
Enhance environmental governance & community stewardship



GOAL 2.2
Study, monitor & proactively plan for ecosystem benefits



GOAL 2.3
Promote circular economy through waste management



GOAL 2.1

Enhance environmental governance & community stewardship

WHY?

Environmental governance encompasses various functions of different line departments and institutions in the Pune urban region right from water to waste, energy to gardens, transport to forests, housing to service provision, education to planning, culture and heritage. The public, too, has historically been active in bringing environmental concerns to the forefront of governance in Pune. However, there is a lack of an overarching, responsive and proactive environmental governance framework and coordination mechanism among various institutional actors.

Efforts are needed to build upon the historical perspective, further curate knowledge and databases. This should be used to advance evidence-based policy-making and scenario building for future predictions and comprehensive planning.

HOW?

ACTION 2.1.1

Expand institutional mandate and capacity of PMC to conduct proactive environmental planning and monitoring

ACTION 2.1.2

Facilitate community stewardship and action for conservation

ACTION 2.1.3

Ensure well-being of vulnerable groups dependent on ecosystems in conservation plans

ACTION 2.1.1

Expand institutional mandate and capacity of PMC to conduct proactive environmental planning and monitoring

The PMC has a mandate for improving the urban environment. Currently, the Environment Dept is part of the Garden Dept. Among the activities of the Environment Dept are technical inputs for certain types of projects directly impacting natural ecosystems in the city, preparation of the mandatory Environment Status Report by compilation of secondary data and analysis of certain types of primary environment monitoring data, and management of the Indradhanushya facility. The Garden Dept manages all the public gardens, maintains avenue trees, conducts the Tree Census, supports the Tree Officer in managing the applications for tree-felling, etc.

There is a need for a more comprehensive style of management of the urban environment that includes the prevention of pollution, remediation and restoration of degraded environments, protection and conservation of natural assets, and addressing climate change impacts. The SDG framework is well aligned with resilience enhancement. Setting up a monitoring and reporting system for the set of goals and indicators relevant at the city level would be very useful in resilience efforts. This will require strengthening the Environment Dept with an enlarged mandate, enhanced technical capacity, growth in human resources and proper budget allocation.

Lead: PMC

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Expand annual Environmental Status Reporting to SDG Monitoring and Reporting <i>Led by PMC City-wide Program Proposed by Resilient Pune Near-term</i>	To institutionalize monitoring of city-specific SDG indicators, to enable reporting on progress on the targets adopted by the city through a consultative process, to use the information for developing and implementing projects towards achieving the selected goals, and reporting to national and international SDG monitoring processes	<ul style="list-style-type: none"> Adequate capacity at the Environment Dept to undertake SDG monitoring and reporting Availability of monitoring reports on the city specific SDGs, indicators and targets identified and adapted Use of the monitoring reports in developing projects towards improving sustainability performance Submission of reports to national and international SDG monitoring processes 	<ul style="list-style-type: none"> Helps achieve SDG targets at city level and course correct if necessary Enhances governance
Set up a Blue-Green Infrastructure Program at PMC Environment Dept <i>Led by PMC Regional Program Proposed by Resilient Pune Medium-term</i>	To enable creation of blue-green infrastructure, including for waste water treatment, ground water recharge, heat and pollution screens, healthy soils, etc., by conducting studies, comparative analysis of costs and benefits, advocating for blue-green infrastructure options, wherever feasible, and planning and piloting of projects	<ul style="list-style-type: none"> Development of Pune blue-green infrastructure handbook (to be based on groundwater recharge and discharge zones) Adoption of recommendations into DCR and on-going/future infrastructure projects like river restoration, complete streets, plantation drives, etc 	<ul style="list-style-type: none"> Helps improve environmental quality Avoids high energy and input-based hard infrastructure Fosters innovations for sustainability
Adopt recommendations from Pune Resilience Accelerator for Mula-Mutha river ecosystem conservation and sustainable use planning <i>Led by 100RC resilience Accelerator & Columbia University Regional Program On-going Medium-term</i>	To protect, conserve and ecologically enhance the river and lake ecosystems in the region through an integrated eco-restoration approach	<ul style="list-style-type: none"> Program and plan prepared with the implementation mechanism Actions for conservation and eco-restoration of the river and lake ecosystems in Pune region 	<ul style="list-style-type: none"> Conserves and restores river and lake ecosystems Provides risk proofing against disaster and climate change Enhances ecosystem benefits

SUSTAINABLE DEVELOPMENT GOALS



ACTION 2.1.2

Facilitate community stewardship and action for conservation

PMC has developed the Indradhanushya Centre for Citizenship and Environment Education and has been conducting school environment education, as well as facilitating sustainability oriented programs for the public, such as exhibitions, film festivals, workshops, and dialogues.

There is also a wealth of community movements and efforts by NGOs and academic institutions for promoting environmental understanding and conservation action. Continuing these efforts, synergizing and supporting their expansion, and linking them to the SDGs would be very valuable.

Education for Sustainable Development (ESD) is a key strategy to enhance resilience in society. UNESCO suggests that

learning to live together sustainably in cities and communities is one of the most important educational challenges of our time. SDG 4.7 focuses on ESD. Experiential, action-learning approaches to enable interaction with restoring and managing natural assets may be useful for Pune. Further, pilot projects may be initiated with a view of developing ways of strengthening and supporting community stewardship, especially with a focus on knowledge about sound ecosystems management. These initiatives would go a long way in improving natural landscapes and resilience of the Pune region.

Lead: PMC Environment Dept, NGOs

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Institute Sustainability Dialogues for public awareness and participation in monitoring the progress of localized SDGs <i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i>	To create understanding about the SDGs, develop localized SDGs among various sections of the public and enable public participation in monitoring the progress for achievement of SDGs and targets	<ul style="list-style-type: none"> ◦ Institutional structure in place with adequate resources ◦ Number of dialogues organized ◦ Number of participants in monitoring process 	<ul style="list-style-type: none"> ◦ It promotes engaged communities ◦ It helps create sense of shared ownership ◦ Build capacities in communities to be well informed and adaptive
Encourage community stewardship through developing a Conservation and Learning Centres Network for hills, gardens, waterbodies <i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i>	To build upon existing citizens' movements and efforts for conservation of ecosystems and natural habitats in Pune, to create a robust system for experiential learning about ecosystems and services they provide, while facilitating public participation in scientific conservation actions at these sites and others	<ul style="list-style-type: none"> ◦ Number of Learning Centres developed ◦ Number of people engagements achieved ◦ Improvement in public awareness about ecosystems, their values ◦ Public participation in conservation actions 	<ul style="list-style-type: none"> ◦ It develops institutional mechanism and in-situ infrastructure towards public awareness ◦ It helps public engagements and creates a sense of ownership ◦ It fosters scientific management of ecosystems by public groups
Develop a Pune Natural History Museum <i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i>	To develop a state-of-the-art interpretation facility about the natural history of the city and the region, in order to promote public understanding of the local biogeography and strengthen technical support for community conservation efforts	<ul style="list-style-type: none"> ◦ Number of visitors ◦ Effectiveness of interpretive approaches in terms of public understanding ◦ Availability of guidance for conservation efforts ◦ Partnerships with other Natural History Museums, Exchanges, special events and generation of new resources 	<ul style="list-style-type: none"> ◦ Supports greater understanding about the local and regional environment, learning from the past, and developing competence for more sustainable living
Sustain-Learn - Initiate a resilience learning program for schools, colleges and community groups <i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i>	To develop sustainable development competencies among students and communities, and encourage them to take positive actions for enhancing resilience and sustainability in their own spheres; such competencies include systems thinking, critical thinking, ecological sensitivity, empathy, dealing with ambiguity, and working collaboratively	<ul style="list-style-type: none"> ◦ Enhanced competencies among the learners and community groups ◦ Number of action projects, participants and generation of knowledge and actions 	<ul style="list-style-type: none"> ◦ Sustainable development competencies among its citizens form the bedrock for city's social, economic and ecological resilience ◦ It adds to robustness and inclusiveness of city systems

ACTION 2.1.3

Ensure well-being of vulnerable groups dependent on ecosystems in conservation plans

Biodiversity provides multiple ecosystem benefits to urban dwellers. These include direct benefits such as places for recreation, as well as as sources of food, firewood, medicinal herbs and forage for cattle and sheep, supporting life and livelihoods of various vulnerable and marginalized groups, such as dhangars (herders) and katkaris (tribals). Their traditional rights and use arrangements of village commons and fields have been disrupted with changes in urban physical form and governance, often causing conflicts.

A process is needed to recognize the direct dependence on ecosystems and knowledge of communities, and dialogue to ensure sustainable use and conservation of natural assets. Their deeper knowledge and cultural connections are valuable, intangible resources that can enrich understanding about nature among city folks.

Lead: PMC, NGOs (e.g. Anthra, CEE, Ecological Society), research institutes (e.g. BVIEER, ARI)

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Initiate 'Pastoral Pune' Project <i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i>	To secure access to biodiversity resources and promote understanding of biocultural knowledge of traditional nomadic pastoral groups, by mapping their routes and spaces, conducting dialogue, identifying ways of protecting livelihoods and biodiversity and enabling knowledge sharing	<ul style="list-style-type: none"> ◦ Mapping of historical and present routes, spaces and their status done ◦ Enhanced understanding of dependencies, ecosystem knowledge and practices of nomadic communities ◦ Tools for policy making/changes ◦ Knowledge sharing platforms and activities 	<ul style="list-style-type: none"> ◦ Helps create a just and inclusive system ◦ Helps develop an integrative approach in ecosystem resources management using traditional and experiential knowledge and by considering alternative ways
'Mase Khegade Zinge' - Sustainable development of waterscape and dependent communities in Pune urban region <i>Led by PMC and PMRDA City-wide Program Proposed by Resilient Pune Medium-term</i>	To develop sustainable livelihood options for vulnerable communities dependent on waterscapes in the Pune metropolitan region by participatory mapping of their livelihoods dependencies, and building on their traditional and experiential knowledge	<ul style="list-style-type: none"> ◦ Enhanced understanding through mapping ecosystem status and dependencies ◦ Improvements in alternative livelihoods for vulnerable communities developed ◦ Enhanced ecosystem services 	<ul style="list-style-type: none"> ◦ Helps create a just and inclusive system ◦ Helps develop an integrative approach in ecosystem resources management using traditional and experiential knowledge and by considering alternative ways
Energy security for urban poor, reducing firewood usage <i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i>	To assess the dependencies on conventional biomass energy sources and provide for climate sensible alternatives for urban poor	<ul style="list-style-type: none"> ◦ Reduction in conventional biomass energy use ◦ Improved health and air quality 	<ul style="list-style-type: none"> ◦ Helps create a just and inclusive system while retaining redundancy value ◦ Contributes to health and well-being of public



GOAL 2.2

Study, monitor & proactively plan for ecosystem benefits

WHY?

City development encompasses economic and environmental aspects of growth, with an aim to improve human well-being. Human settlements have enormous dependency on the services and benefits provided by natural ecosystems. Conversely, they also modify and impact ecosystems in many different ways.

Ecosystems are dynamic systems and sub-systems. Developing a scientific and evidence-based understanding of ecosystems, their status and benefits is a critical prerequisite to developing conservation and sustainable use management plans. Studies to map these ecosystems and their status, and appropriate monitoring systems are essential. Such studies can also help in valuing the services and devise ways for payment of ecosystem services and conservation cost benefits to strengthen development strategies.

HOW?

ACTION 2.2.1

Map and develop an information base of ecosystems, their ecological attributes, benefits and benefits valuation

ACTION 2.2.2

Map, monitor and manage urban groundwater

ACTION 2.2.3

Conduct climate change studies and create a Pune Climate Action Plan

ACTION 2.2.4

Comprehensive air quality monitoring, impact studies and Air Action Plan

ACTION 2.2.1

Map and develop an information base of ecosystems, their ecological attributes, benefits and benefits valuation

Biodiversity in urban areas is an important indicator of the health of the ecosystem. It influences local climate, nutrient recycling, air quality, water quality, provides resources (e.g. grazing, firewood), cultural and recreational services which people depend upon, directly and indirectly. These dependencies are not adequately mapped. PMC has taken a major initiative of conducting a tree census using technological tools. Additional data sets on species, habitats, ecosystems and the nature of human dependence/interrelationship need to be developed. Participatory methods such as People's Biodiversity Registration (PBR) involving residents as well as migrating communities are effective in mapping cultural aspects of biodiversity, dependencies and in developing a sense of belonging.

Pune faces disease outbreak threats due to mismanagement of its biodiversity. Pune's climatic conditions can aggravate this problem. Elements such as invasive birds like rock pigeons, allergen-containing plant species like the Satvin tree (*Alstonia scholaris*) have been reported to create health hazards. Pet breeding and owning is a fast-growing economic and cultural activity. Lack of any database and management system leaves this activity beyond the city's administration, though animal welfare, public health and pounds for animals are part of the municipal government's responsibility. This can be a significant area to create positive values for Pune's resilience.

Lead: PMC Environment Dept.

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Develop the Pune Local Biodiversity Strategy and Action Plan (LBSAP) <i>Led by PMC</i> <i>City-wide Program</i> <i>Proposed by Resilient Pune Medium</i>	To develop a Local Biodiversity Strategy and Action Plan (LBSAP), including through participatory mapping of ecosystems and environmental assets, participatory ecosystems valuation, and integration of such information into the GIS maintained by the municipal authorities for development planning and work of the line departments, as relevant	<ul style="list-style-type: none"> A comprehensive Strategy and Action Plan is created, which builds upon ongoing and proposed biodiversity database projects City biodiversity index is created Citizen participation processes and pilots at Ward/Mohalla Samiti level are done to arrive at conservation, sustainable and equitable use priorities The LBSAP informs Development Planning processes 	<ul style="list-style-type: none"> Ensures continuity of critical services by maintenance of assets and ecosystem management
Pune Pets and Plantations Project <i>Led by PMC and PMRDA</i> <i>City-wide Program</i> <i>Proposed by Resilient Pune Medium-term</i>	To undertake studies of the economic burden/value of pets, pests and health hazards such as rock pigeons, Satvin trees which would help to develop a mechanism within PMC to ensure effective review of policies, quarantine and regulation of such significant biodiversity elements	<ul style="list-style-type: none"> Studies are undertaken Protocols (based on the findings of these studies) are adopted for management of specific biodiversity elements Creation of database and management system, rules and regulations formulated by PMC Level of citizen awareness, and increased trend of adoption of local breeds and decline in planting, promoting hazardous species 	<ul style="list-style-type: none"> Addresses disease outbreaks, invasive species and loss of biodiversity

SUSTAINABLE DEVELOPMENT GOALS



ACTION 2.2.2

Map, monitor and manage urban groundwater

PMC fulfils its mandate of water supply to the city, currently over 1300 million litres per day, through an arrangement with the state Irrigation Department by which an allocation is made from the storage at Khadakwasla and other dams. With increases in water demand, Pune will need to put in place demand management measures, waste water recycling and develop groundwater resources. Currently, thousands of borewells are operational in the city, but the quantity of groundwater drawn is unknown. Groundwater provides an

important buffer against low rainfall and shortages in surface water storages. Sustainable management of groundwater requires better information about the groundwater resources, and a strategy to improve recharge. In the medium-term, improved information and monitoring processes would help devise sustainable use strategies with the participation of the public.

Lead: PMC Water Dept, GSDA

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Groundwater mapping, data centre and visualization platform <i>Led by PMC & GSDA City-wide Program On-going Medium-term</i>	To set up a mechanism for comprehensive mapping (leading to a Pune Aquifer Map), and regular monitoring of aquifers in Pune, towards strengthening the knowledge base on the status and utilization of groundwater resources in Pune	<ul style="list-style-type: none"> ◦ A data centre equipped with required technology, resources and capabilities is set up ◦ Periodic reports are published 	<ul style="list-style-type: none"> ◦ Availability of scientific and transparent information for decision-making and resource management ◦ Improved and informed management of an alternative water resource for stress situations
Institute a Ground Water Cell under the PMC Water Dept <i>Led by PMC & GSDA City-wide Program On-going Medium-term</i>	To enable conservation and equitable and sustainable utilization of groundwater resources by setting up a transparent, accountable and capable public system for its governance, and linking it to related public authorities	<ul style="list-style-type: none"> ◦ Public recharge systems in place ◦ Improvements in availability and quality of groundwater 	<ul style="list-style-type: none"> ◦ Institutionalization of groundwater governance at urban local level ◦ Availability of alternative resource base for the stress scenario of water deficits in seasonal and drought occurrences
Policy and plans for regulation of groundwater recharge and discharge zones and usage in Pune <i>Led by PMC & GSDA City-wide Policy/Regulation Proposed by Resilient Pune Medium-term</i>	To protect groundwater recharge and discharge zones through appropriate measures added to the zoning/land-use plans and DC Rules, and integrating the Pune Aquifer Map into the enterprise GIS maintained by PMC	<ul style="list-style-type: none"> ◦ Policy guidance available for protection and regulation of groundwater recharge and discharge zones ◦ Adoption by plot owners of guidelines for recharge and discharge areas 	<ul style="list-style-type: none"> ◦ Protection, conservation and informed management of aquifers and groundwater
Participatory Groundwater Monitoring & Management Program <i>Led by PMC City-wide Program On-going Medium-term</i>	To engage stakeholders and communities, enhancing their understanding of groundwater, setting up 'aquifer users associations', and citizen science programs to monitor groundwater quality and quantity	<ul style="list-style-type: none"> ◦ Functioning aquifer users' associations for the various aquifers in Pune ◦ Regular participatory assessments of groundwater through a citizens science program 	<ul style="list-style-type: none"> ◦ Enhanced understanding among communities about groundwater resources and their sustainable management

ACTION 2.2.3

Conduct climate change studies and create a Pune Climate Action Plan

A Carbon Inventory has been prepared by PMC in 2012. As a major city in India, Pune can help contribute to the climate change mitigation targets of the country. Building upon the earlier carbon inventory, more detailed and updated inventories, including estimates of indirect emissions are needed, to develop sector specific emissions reduction plans.

With a large population increasingly impacted by climate change, Pune must also put in place a structured adaptation

plan that focuses on the most vulnerable groups and sites. Climate change impacts include flood risks, increased aridity, extreme heat, vector-borne diseases. Vulnerability assessments and adaptation plans will help identify climate risks, and sectors and communities exposed to specific risk factors, and help to prioritize risk-reduction actions.

Lead: PMC Environment Dept, Climate Collective Pune, other NGOs, academic institutions

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Climate Change Mitigation and Adaptation Action Plan for Pune <i>Led by PMC City-wide Planning On-going Medium-term</i>	To develop GHG mitigation strategies and municipal adaptation plan (MAP), prepare vulnerability reduction and climate risk proofing strategies for Pune city and the metropolitan region, especially for the most vulnerable communities in the city	<ul style="list-style-type: none"> ◦ GHG Inventory protocols set and publicly available ◦ Vulnerability assessment report with identification of most vulnerable communities, sites and sectors ◦ Pune-specific Climate Change Mitigation and Adaptation Action Plan prepared with the strategies for its implementation 	<ul style="list-style-type: none"> ◦ Reduces vulnerability of the communities exposed to urban climate and disaster risks ◦ Improves community level adaptation to climate change ◦ Mitigates GHG emissions from different urban sectors
Renewable Energy and Energy Efficiency program <i>Led by PMC and PIC City-wide Program On-going Medium-term</i>	To enhance adoption of renewable energy through the Solar City project, and by developing a Solar Facilitation cell at PMC to set ambitious targets, address policy and institutional challenges, and undertake outreach to the public	<ul style="list-style-type: none"> ◦ Increase in number of RE installations and installed capacity ◦ Reduction in grid-drawal ◦ Increased share of RE in city energy demand and consumption 	<ul style="list-style-type: none"> ◦ Reduces GHG emissions ◦ Increases energy security

ACTION 2.2.4

Comprehensive air quality monitoring, impact studies and Air Action Plan

The Central Pollution Control Board (CPCB) has prescribed the National Ambient Air Quality Standards (NAAQS) in 2009 under the Air (Prevention and Control of Pollution) Act. Pune is among the 102 cities identified across India that consistently violate these standards. The National Clean Air Programme (NCAP), launched by the Ministry of Environment, Forest and Climate Change, has a goal to reduce air pollution by 20-30% by 2024, which Pune must also comply with.

Steps to improve air quality management and reduce health risks to the public include – robust systems for monitoring of air quality, modelling and projection of impacts, putting in place a detailed, locale-specific plan for mitigation of air pollution, and communication of health risks and mitigation measures.

Lead: PMC Environment Department

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Strengthen the Air Quality Monitoring Program with adequate monitoring stations and equipment</p> <p><i>Led PMC, CPCB/MPCB City-wide Program On-going Short-term</i></p>	To conduct comprehensive air quality monitoring of point and mobile sources, source apportionment study, and spatial modeling to generate information for scientific and evidence-based air quality management specific to different sources	<ul style="list-style-type: none"> Adequacy of equipment for monitoring ambient air quality and different sources of pollutants Availability of daily data in open source forms for analyses 	<ul style="list-style-type: none"> Makes emission data available for improving urban air quality and reducing its health and other impacts
<p>Institute Health and Exposure Studies, especially for specific populations with high exposures</p> <p><i>Led by PMC, Health Dept City-wide Program On-going Short-term</i></p>	To commission studies that help develop an understanding of the impacts on health of air pollution on selected vulnerable groups (related to age, physical conditions, occupation, etc.), with a view to developing policy measures, precautions and remedial measures	<ul style="list-style-type: none"> Studies commissioned Data and study results available for improved understanding among the public, health care professionals and policy makers 	<ul style="list-style-type: none"> Helps policy response with better understanding of air pollution impacts on health
<p>Air Quality Data Visualization and Health Communication Program</p> <p><i>Led PMC, MPCB City-wide Program On-going Short-term</i></p>	To set up a program for converting information about air pollution levels into the Air Quality Index and other easily understandable forms, and disseminating this information to the public (especially to high risk groups), so that they can take steps to avoid exposure	<ul style="list-style-type: none"> Air quality visualizations available Air quality communications system in place Range of media used for AQ communication Number of individuals receiving air quality information Extent of understanding about and use of AQ information by the public to reduce exposure 	<ul style="list-style-type: none"> Availability of air quality information helps people take precautions to avoid exposure and help in sound policy making
<p>Air Quality and Emissions Reduction Management, and Risk-reduction Action Plans</p> <p><i>Led by PMC, MPCB City-wide Planning On-going Medium-term</i></p>	To develop a comprehensive, locale-specific plan for air quality management and GHG reduction, including in specific sectors like transportation, waste, energy, and implementation of the plan with engagement of multiple stakeholders across sectors for the city and in the metropolitan area	<ul style="list-style-type: none"> Availability of sector-specific action plans 	<ul style="list-style-type: none"> Improved air quality with improved public health indicators and lower health burden



GOAL 2.3

Promote circular economy through waste management

HOW?

ACTION 2.3.1

Strengthen the capacity of PMC and the circular economy ecosystem towards 100% in situ processing of organic wastes, recovery of recyclables and liquid waste management

ACTION 2.3.2

Support formalization of scrap recycling economy and improve sanitation worker safety and livelihoods

ACTION 2.3.3

Promote public behaviour change for sustaining the circular economy

WHY?

Pune is recognized as a city with a progressive waste management system. About a decade ago, PMC entered into an agreement with SWaCH (Solid Waste Collection and Handling), a cooperative of waste pickers, integrating them into doorstep waste collection services. This has helped improve source segregation and retrieval of recyclables. PMC has also set up bio-methanation plants and incentivized composting. Yet, several hundred tons of waste do reach the landfill every day.

Newer approaches of waste governance, finance, management and physical systems are needed to respond to the ideals of circular economy. Decentralized systems for scrap recovery and organics processing, improving the recycling chain and instituting Extended Producer Responsibility are steps that will help enhance the circular economy. A creative and sustained outreach strategy to all stakeholders and participatory governance that engages citizens as well as the private sector will help develop more robust systems, accelerate and smoothen the transitions desired.

SUSTAINABLE DEVELOPMENT GOALS



ACTION 2.3.1

Strengthen the capacity of PMC and the circular economy ecosystem towards 100% in situ processing of organic wastes, recovery of recyclables and liquid waste management

Over the last decade, the Pune Municipal Corporation has instituted doorstep waste collection through SWaCH, a cooperative of waste pickers that has provided safer work conditions and other worker benefits, as well as improved source segregation of wastes. Enhancing the extent of doorstep collection to cover the entire city, especially in areas that have been recently added to the municipal jurisdiction, and improving the quality of services are among the next set of priorities.

The Pune Smart City Development Corporation Ltd has recently initiated a Zero Waste project that aims at 100% in situ processing of organic waste. This pilot project will help

understand the institutional changes and capacities needed, including for promoting source segregation of waste streams, and decentralized organic waste processing. Efforts are also needed to enhance retrieval of recyclables, closing or shortening recycling loops and setting up systems to enable Extended Producer Responsibility (EPR) for difficult to recycle materials. Similarly, waste water treatment too will require innovations, including market-based approaches to mitigate untreated effluents. Good quality data, MIS and GIS on waste generators, collection services and processing sites would provide critical inputs for effective management of these services and facilities.

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Continue Zero Waste Wards – pilot for 100% organic waste management <i>Led by PSCDCL and PMC Citywide Scheme On-going Short-term</i>	To set up ward level systems with appropriate institutional capacity (planning, M&E, operations, finance, public outreach, enforcement, IT systems, etc.), and physical systems towards 100% in situ, decentralized organic waste processing, eliminating organic waste in the municipal waste stream	<ul style="list-style-type: none"> Number of functional in-situ composting units Number of bulk generators converted to in-situ composting Number of wet waste vehicle trips of reduced Total PMC budget for wet waste transport saved 	<ul style="list-style-type: none"> Improves public health and sanitation, reduced GHG emissions from transportation of waste and accumulation of waste in the landfill site
Set up an EPR* Desk at PMC to address difficult-to-recycle materials <i>Led by PMC and SWaCH City wide Program Proposed Long-term</i>	To eliminate difficult-to-recycle materials from waste streams, through engagement with producers and other actors, to enable material/product substitution, buy-back, setting up processing systems or other appropriate options for dealing with such wastes	<ul style="list-style-type: none"> Types of difficult-to-recycle material studied and reported Numbers and volumes of difficult-to-recycle materials eliminated from waste reaching landfills 	<ul style="list-style-type: none"> Improves waste management, recovery of recyclables and avoidance of waste going to landfill
Strengthen Waste GIS and Waste Matters Studies <i>Led by PMC, PSCDCL and PMRDA Region Study/database Proposed ADD</i>	To develop a GIS on waste generators, collection services, and processing sites; and to conduct periodic studies with a view to tracking trends and enhance sector efficiency	<ul style="list-style-type: none"> No of data sets GIS mapped Waste characterization and quantification studies to track trends in materials usage, waste disposal behaviour Customer satisfaction surveys Complaints analysis to track trends of public dissatisfaction and to take corrective actions Performance monitoring of composting and recycling systems 	<ul style="list-style-type: none"> Better decision making, and more robust infrastructure and services of waste management.
Initiate ‘StreamLine Pune’ – a nalla rejuvenation program <i>Led by PMC Citywide Study To be initiated medium-term</i>	To develop a policy for stream rejuvenation, building upon efforts such as the Osho Nalla Park, and support projects for nalla rehabilitation and treating waste water run offs	<ul style="list-style-type: none"> Total length and number of nallas rejuvenated Volume of run-off waste water treated 	<ul style="list-style-type: none"> Rejuvenates streams and nallas as blue-green infrastructure, thus helping carry away flood waters, clean waste water, and improve wildlife habitat

ACTION 2.3.2

Support formalization of scrap recycling economy and improve sanitation worker environmental compliance is imperative. This must be done through participatory approaches and institutional capacity building. Enhancing the circular economy also means shortening the materials loops and reducing distances for transport of materials. Re-organization of the physical systems for materials movement and recycling may be needed to enhance the value of the recycling economy in Pune.

Progress towards a Circular Economy including waste reduction and increasing materials recycling. In Pune, as in much of India, the scrap recycling economy is largely in the informal sector. While recycling provides economic and environmental gains, the informal nature of the sector often means hazardous work conditions and pollution from mismanaged materials recovery processes.

Support to the sector for integrating worker welfare and

environmental compliance is imperative. This must be done through participatory approaches and institutional capacity building. Enhancing the circular economy also means shortening the materials loops and reducing distances for transport of materials. Re-organization of the physical systems for materials movement and recycling may be needed to enhance the value of the recycling economy in Pune.

Lead: PMC, PMRDA, KKP, SWaCH, Scrap traders

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Create a Scrap Map for Pune <i>Led by PMC and SWaCH City-wide Program Proposed by SWaCH Medium-term</i>	To document the movement of scrap materials and quanta, with a view to identifying areas of improvement for occupational safety and livelihoods enhancement, through a participatory methodology engaging workers in this sector	<ul style="list-style-type: none"> Number of scrap vendors and shops listed and mapped Preparation of a materials movement map and database 	<ul style="list-style-type: none"> Fosters long-term and integrated planning of the recycling economy. Understanding the flow and economics of materials, and related livelihoods is essential for initiating improvements in incomes, work conditions, recycling technologies.
Closing the Loops, or shortening recycling loops <i>Led by PMC City-wide Program Proposed Medium-term</i>	To strengthen the network of scrap kiosks at neighbourhood level; develop a scrap wholesale market, assess the feasibility of setting up processing and recycling units locally to reduce transportation distances and costs of recycling	<ul style="list-style-type: none"> Number of materials processed or recycled within the city Improved incomes in the recycling sector 	<ul style="list-style-type: none"> Addresses environmental degradation, improves recycling and the recycling economy
Promote Green Jobs in Recycling <i>Led by Skill India mission and PMC National Study</i>	To set up a skill up gradation and entrepreneurship support program for unskilled and semi-skilled labourers in the informal recycling economy	<ul style="list-style-type: none"> No. of sectors and allied activities identified No. of people trained No. of green jobs created 	<ul style="list-style-type: none"> Facilitates green growth by creating an inclusive and robust system

ACTION 2.3.3

Promote public behaviour change for sustaining the circular economy

PMC is mandated to set up socially and environmentally sound Waste Management systems in accordance with the Municipal Solid Waste Rules 2016. While PMC has made considerable progress in enhancing the coverage of doorstep collection services, a lot more needs to be done to increase the practices of segregation of wastes at households and decentralized, community-managed systems. Public awareness about and engagement in waste management is essential in the quest for a circular economy.

For this, a comprehensive IEC strategy for waste management

may be developed and implemented. It would include information materials about different streams of waste, methods of management, responsibilities of waste generators and service providers, incentives and penalties, impacts of poor management, etc. Residents' associations and citizens networks would need to be supported for conducting area-based campaigns promoting segregation, and setting up/ strengthening community composting and scrap collection centres.

Lead: PMC, PSCDCL, NGOs, residents' associations

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Prepare and implement an IEC strategy for Circular Economy</p> <p><i>Led by PMC City-wide Program Proposed by Resilient Pune Medium-term</i></p>	To inspire and engage the public in responsible waste management and promotion of circular economy, through a comprehensive IEC strategy	<ul style="list-style-type: none"> Level of segregation Extent of shift to in-situ organic waste processing Reduction in waste going to the land fill site Improved ranking of the city in the Swachata Sarvekshan 	<ul style="list-style-type: none"> Helps empower a broad range of stakeholders for positive actions to promote the circular economy Improves public health services
<p>Strengthen/promote Community Compost Networks</p> <p><i>Led by PSCDCL and PMC City-wide Program On-going Medium-term</i></p>	To strengthen and expand existing community-based compost learning and training networks (e.g. Inora) and centres with live exhibits	<ul style="list-style-type: none"> No. of members in the network Availability of diverse types of composting options tried and tested under the network No. of events, meetings and workshops to encourage composting and expand membership 	<ul style="list-style-type: none"> Promotes low carbon sustainability practice through community action
<p>Institute a participatory governance mechanism for Circular Economy</p> <p><i>Led by PMC City-wide Program</i></p>	To institutionalize citizens' participation through ward-level committees for oversight on solid waste management systems, to conduct periodic reviews and streamline outreach to the public	<ul style="list-style-type: none"> Number of committees formed (one per ward) Number of activities and initiatives taken up by committees Public satisfaction with solid waste management systems and services Tangible benefits to circular economy actors in terms of improved source segregation and recovery of recyclables 	<ul style="list-style-type: none"> Promotes robust, transparent and accountable systems for solid waste management, leading to a healthier environment



Image courtesy: [google.com](https://www.google.com)



PILLAR

3

Strengthen the diverse economy & workforce capabilities in Pune

Image courtesy: [google.com](https://www.google.com)

Post independence, Pune has been one of the most dynamic urban economies in India. This was due to its proximity to Mumbai and the western coastline, legacy of cooperatives, industrial growth driven by MIDC* (especially in automotive manufacturing) and high human capital (education/skills) level as a result of being an educational hub. These factors also allowed Pune to take part in India's IT boom.

The region's economy is rooted in diverse industry clusters of auto components, locomotives, agro-based products, electronic consumer durables, pharmaceuticals, chemicals, and IT software among others. However, recent data/trends suggest that some of the traditional drivers of Pune's economic dynamism, especially low-skills manufacturing and IT/ITes, are in decline/evolving and there is a risk that Pune will not be able to compete, provide jobs/livelihoods and meet the aspirations of its young educated population. The adverse impact is more severe in the informal sector, with a majority facing multi-dimensional poverty.

In conclusion, for Pune to leverage its strengths, there is a need for the city to develop sectors beyond IT and auto industry, especially those that generate high employment but also absorb the city's skilled graduates. Pune has the potential to transform itself from being just an educational hub to also being a regional centre of critical research and innovation. However, for the economy to be truly resilient for all, multiple stresses faced by the most vulnerable workers in the city need to be addressed to capitalize on the potential of its citizens.



GOAL 3.1

Boost Pune's economy through skilling and support for business



GOAL 3.2

Ensure every individual in Pune has the opportunity to work in dignity



GOAL 3.3

Promote Pune as a centre for innovation by focusing on creativity, research and development



GOAL 3.1

Boost Pune's economy through skilling and support for business

WHY?

Government of Maharashtra has introduced policies, provided specialized infrastructure, and offered other incentives to attract manufacturing & IT companies in Pune. This demand-led approach to economic development has been successful thus far. But to build economic resilience the city needs to concern, not with identifying or establishing markets alone, but have structures in place to be able to respond to market demands as they arise.

Thus, Pune can benefit from bolstering its supply side infrastructure such as its skilling ecosystem, ease of doing business, and proactive economic planning to have a competitive advantage.

HOW?

ACTION 3.1.1

Create a conducive environment for MSMEs to start, thrive, and expand to generate employment in the city

ACTION 3.1.2

Invest in skilling the workforce for growing and evolving needs of sectors

ACTION 3.1.1

Create a conducive environment for MSMEs to start, thrive, and expand to generate employment in the city

Availability of resources and skilled labour, conducive business environment with strong buying capacity, ease of firm entry and exit, and geographic location with good regional connectivity have contributed to Pune having the highest number of MSMEs in Maharashtra State. However, the state economic survey has shown a decline in MSMEs between 2016-2018. While there is much scope for improvement in intra-city traffic management, reliable power and broadband services to boost enterprise growth, this decline is attributed to the rising cost of doing business, especially in auto manufacturing, and slower adoption of evolving technologies.

Thus, for Pune to remain competitive, by MSMEs will need support in raising productivity, spurring innovation and

building business capabilities. The city will also benefit from catalysing enterprise creation in newer clusters that leverage its core strengths in manufacturing-engineering (like low-cost medical devices), and arts-culture (creative economy, tourism). With about 70% of Pune's workforce participating in the informal sector, the city needs to make it easier for the informal self-employed to register their businesses, pay operating fees where necessary, as well as make taxation progressive and transparent. However, within those that are self-employed by choice, 'choice entrepreneurs', and not by necessity, will need support to start, grow and create jobs. Those that are self-employed out of need, 'necessity entrepreneurs', will need pathways for gainful employment.

Leads: Industry Associations in Pune and MCCIA

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Promote mass entrepreneurship <i>Led by Led by Global Alliance for Mass Entrepreneurship National Program Proposed by Resilient Pune Medium</i>	To catalyze mass entrepreneurship (businesses with min. five employees) by making entrepreneurship aspirational, nurturing entrepreneurial mindsets, converting job-seekers to entrepreneurs, helping micro-enterprises grow, and enabling women to start and succeed as mass entrepreneurs	<ul style="list-style-type: none"> ◦ Increase in mass entrepreneurs ◦ Increase in women mass entrepreneurs ◦ Increase in average firm sizes ◦ Number of jobs created 	<ul style="list-style-type: none"> ◦ Creates a stable economy by promoting businesses that leverage local resources to solve local challenges, while providing employment at the local level ◦ Promotes 'choice entrepreneurs' over 'necessity entrepreneurs'
Initiate Enterprise Pune <i>Led by Industry associations in Pune City-wide Program Proposed</i>	To promote MSME growth by focusing on raising firm productivity, spurring innovation and building their business capabilities. These can be offered through good low-cost business consulting, legal aid, grants, and forging partnerships	<ul style="list-style-type: none"> ◦ Increase in productivity for firms enrolled in the program/availed grant ◦ New businesses capabilities acquired by enrolled firms ◦ Number of patents filed through Enterprise Pune 	<ul style="list-style-type: none"> ◦ Increases number of enterprises, their productivity, employment, and expands the city's tax base
Support adoption of 'The Street Vendors Act (2014)' <i>Led by Govt. of India National Regulation On-going Short-term</i>	To protect the livelihood rights of street vendors as well as regulate street vending through demarcation of vending zones, conditions for and restrictions on street vending	<ul style="list-style-type: none"> ◦ Increased participation of street vendors in Town Vending Committees ◦ Reduction in harassment of street vendors ◦ Creation of street vending plan in consultation with vendors ◦ % land for hawking zones of total commercial use 	<ul style="list-style-type: none"> ◦ Protects the livelihood rights and social security of urban street vendors ◦ Integrates street vending into formal city planning exercises ◦ Aids poverty alleviation
Continue periodic 'Ease of Doing Business: An Enterprise Survey of Indian States' <i>Led by NITI Aayog National Study On-going</i>	To assess business regulations and enabling environment across India from the perspective of firms across states, sectors, and enterprise types	<ul style="list-style-type: none"> ◦ Improvements in performance of ease of doing business indicators (infrastructure, utilities, access to capital, jobs created, GDP contribution, ease of firm entry/exit, export contribution, etc.) 	<ul style="list-style-type: none"> ◦ Creates an environment that fosters firms to compete, drive and sustain growth

SUSTAINABLE DEVELOPMENT GOALS



ACTION 3.1.2

Invest in skilling the workforce for growing and evolving needs of sectors

The Pune District skill-gap study conducted by National Skill Development Corporation (NSDC) forecasts that the district is likely to generate incremental demand/jobs for about 2.85 million persons between 2012 and 2022. So as to create planned employment, it is essential to understand the skills demanded by projected job growth, and the current skill levels in supply in the region.

The 811 colleges in the Pune urban region, the Pune Lighthouse program along with many other institutions in the city form a rich but disaggregated skilling ecosystem.

Numerous stakeholders offer training programmes of varying standards with multiplicity in assessment and certification systems which are not comparable. These need to be consolidated and standardized across the urban region, and supplemented with strategic vocationalization of higher education. This vision is also in alignment with the national level transformation in which the government shifts from being a skills provider to a regulator, facilitated by a tech stack for local skilling ecosystems to plug into.

Leads: Pune City Connect, Gokhale Institute and Pune Social Development Dept.

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Welcome transformation in role of 'Ministry of Skills Development & Education' (MSDE)</p> <p><i>Led by MSDE National Entity On-going Medium-term</i></p>	To shift from the role of a skills provider to a facilitator of a demand-driven and learner-centric skills ecosystem, through regulation, financing, incubation, and advocacy	<ul style="list-style-type: none"> Improved mobility between skilling and general education Improved employability and entrepreneurial outcomes Increase in non-formal education for out-of-school learners/workers Increased demand for formal skills training Formal recognition of skills acquired by apprenticeships 	<ul style="list-style-type: none"> Unlocks human capital to trigger a productivity dividend Brings aspirational employment and entrepreneurship pathways to all
<p>Support creation of the newly formed 'National Council For Vocational Education And Training (NCVET)'</p> <p><i>Led by MSDE National Entity On-going Medium-term</i></p>	To regulate the functioning of entities in vocational education and skills training by establishing minimum standards for them. The NCVET is formed by merging of the National Council for Vocational Training and the National Skills Development Agency into one independent agency	<ul style="list-style-type: none"> Minimalistic and user-friendly guidelines to recognise and regulate awarding bodies (accredit training institutions) and the assessment agencies (assess learner performance). 	<ul style="list-style-type: none"> Enhances market relevance of skill development programmes.
<p>Support expansion of 'Pune Lighthouse' to all wards of the city</p> <p><i>Led by Pune City Connect City-wide Program On-going Medium-term</i></p>	To provide the underprivileged youth of Pune a chance to explore possibilities for enhancing their skills and pursuing a meaningful career	<ul style="list-style-type: none"> Increase in enrolment numbers Increase in number of graduates who receive placements Increase in employee retention rates of graduates who are connected to jobs 	<ul style="list-style-type: none"> Improves employability of vulnerable youth Creates 'choice entrepreneurs' among urban poor in Pune Builds support network for vulnerable youth in Pune
<p>Conduct Skills Gap Analysis in Pune</p> <p><i>Led by PMC Social Development Dept. City-wide Study Proposed by Resilient Pune Short-term</i></p>	To identify gaps between skills demanded by current and future industry needs and those supplied by human capital in the Pune urban region	<ul style="list-style-type: none"> Baseline data capturing employer needs and supply gaps by high potential sectors of growth/employment in Pune Employability of graduates from universities in Pune 	<ul style="list-style-type: none"> Creates baseline data to make informed decisions on design and investments in skilling programs
<p>Create a skills platform - 'Pune Skills World'</p> <p><i>Led by Pune City Connect City-wide Platform Proposed by Resilient Pune & Pune City Connect Medium-term</i></p>	To create a collaborative social enterprise that aims to extend accredited skill development programmes in Pune through digital platforms and connect to apprenticeships	<ul style="list-style-type: none"> Student enrollment on the platform Number of accredited courses & service providers Number of industry partners/employers Number of apprenticeship matches 	<ul style="list-style-type: none"> Provides demand-driven skills Provides pathways for vocational education to employment Consolidates the skills ecosystem in Pune



GOAL 3.2

Ensure every individual in Pune has the opportunity to work in dignity

WHY?

The productivity of Pune depends on a hybrid urban economy that comprises economic diversity i.e. formal and informal businesses and services. The informal workforce in Pune, constituting about 70% of total workforce, is more exposed to – and less protected against – common core contingencies such as illness, disability, and property loss, compared to formally engaged workers. The self-employed and non-standard employees are also particularly vulnerable to market fluctuations. Workers in the informal sector often struggle with the shocks and stresses of working in hazardous conditions, lack secure assets, basic infrastructure, and social services. They also operate with limited rights and inclusion as workers or citizens; thus perpetuating a cycle of poverty for them.

Thus for Pune to be more resilient, it has to support the economic rights of the working poor in the informal economy.

HOW?

ACTION 3.2.1

Ensure universal delivery of social protection, and improve government regulation and worker entitlements for informal work

ACTION 3.2.2

Improve women's participation in paid work across income groups and education levels, to increase economic productivity and gender equity

SUSTAINABLE DEVELOPMENT GOALS



ACTION 3.2.1

Ensure universal delivery of social protection, and improve government regulation & worker entitlements for informal work

Social protection is a policy instrument to reduce vulnerability, break intergenerational cycles of poverty, and foster social cohesion. The ILO highlights nine work-related contingencies that all workers should be protected against as a minimum – medical care, sickness benefit, unemployment benefit, old-age benefit, employment injury benefit, family benefit, maternity benefit, invalidity benefit, and survivors’ benefit. Extending these to informal workers is one way to support their transition from informal to formal economy. Universal coverage of contributory and tax-financed social protection measures are needed to boost coverage for these groups. But other delivery barriers must also be addressed, including lack of legal identification, limited awareness of programs, high opportunity costs to access them, and distrust or lack of familiarity with formal bureaucracies, especially since programs are operated under various city, state and national government departments. From the perspectives of government agencies, i.e the supply side, challenges

include limited data and record keeping, especially of seasonal migrants.

Workers belonging to industries that are poorly regulated or where enforcement is challenging (domestic work, construction, sanitation, transportation) may be further alienated from basic entitlements. The risks and regulations vary and need to be assessed individually and suitable regulations for each need to be developed and enforced. To do this, workers need to be able to organize themselves and have representation in institutions and processes that set policies and the ‘rules of the (economic) game’. Supporting the growth of their organizations, building capacity for leadership, policy advocacy, and collective bargaining – is both an end in itself – as informal workers achieve a sense of empowerment and are able to support each other, and a means to leveraging wider impact at the local, national and international levels.

Leads: PMC Social Development Dept and Hakdarshak

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Improve beneficiary experience of PMC Direct Benefits Transfer and Services portal (DBTs) <i>Led by PMC City-wide Infrastructure On-going Medium-term</i>	To disburse benefits, subsidies or services to the intended beneficiaries, (currently via Aadhaar Payment Bridge) with convergence across PMC departments on a DBT Services Portal	<ul style="list-style-type: none"> No exclusions from availing benefits due to Aadhaar-based biometric authentication Robust grievance redressal mechanism and information kiosks are in place Reliable information on receipt of transfers is communicated 	<ul style="list-style-type: none"> Automates various functions and processes involved in the administration of DBT, reducing duplication/redundancies, and leakages
Expand ‘Hakdarshak’s’ reach in Pune <i>Led by Hakdarshak National Entity On-going Medium-term</i>	To connect citizens with their eligible welfare schemes using a tech platform and with door-step scheme application support	<ul style="list-style-type: none"> Increase in number of citizens connected to welfare schemes Partnerships with large employers of labor force (ex: construction companies/manufacturing) 	<ul style="list-style-type: none"> Helps citizens discover, apply for and benefit from eligible government and private welfare schemes, thereby plugging the information gap about entitlements, using technology
Initiate Engagement Guidelines for Informal workers	To ensure informal workers unions/collectives/leaders are formally engaged in participatory policymaking and rule-setting processes	<ul style="list-style-type: none"> Engagement Guidelines for informal workers are created and followed 	<ul style="list-style-type: none"> Ensures policies and programs are robust by including voices of beneficiaries

ACTION 3.2.2

Improve women’s participation in paid work across income groups and education levels, to increase economic productivity and gender equity

In India, only 27% of women do paid work, compared to 40% in South Asia. In fact, only 19% of skilled women participate in India’s workforce. More than in any other country, attitudes towards women’s responsibilities at home prevent them from entering the workplace. Indian women do six times as much housework as men – the least balanced ratio in the world. This means that those who do manage to juggle this work with a career face extreme time poverty.

Apart from household chores, women are the primary caregivers for seniors and children. The burden is faced more severely in low-income households that are dependent on public healthcare and child care services. Long waiting times, high user fees and poor quality services mean they either do

not seek out or do not have access to preventative care. When these public services are not available, it is women who take time away from work to care for the ill and young children, thus reducing their daily income and savings over the long-term, potentially leading to debt as well. While improving access to and quality of public services is the bedrock of effective social protection policies, the city can also lead the way in professionalizing senior and child-care services for various incomes groups. This especially makes sense for Pune since it is a sought-after retirement destination.

Leads: PMC Social Development Dept and National Urban Livelihoods Mission (NULM)

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Support Mission for Elimination of Poverty in Municipal Areas (MEPMA) <i>Led by PMC-SDD & NULM City-wide Program On-going Medium-term</i>	To facilitate formation of Self-Help Groups, Slum & Town Level Federations, and pursue economic collectives beyond geographically bound SHGs	<ul style="list-style-type: none"> Increased enrolment, especially of lower caste and class women Number of enterprises created by women participating in MEPMA 	<ul style="list-style-type: none"> Promotion of local self-governance and empowerment of women, especially of lower class and castes The network can be leveraged for multiple things like community development, emergency relief, information dissemination, enterprise creation, etc.
Promote professionalized care infrastructure for children and seniors <i>City-wide Multiple Proposed by Resilient Pune Long-term</i>	To harness strong communities and untapped social capital in Pune to bolster care infrastructure for children and seniors	<ul style="list-style-type: none"> Affordable care facilities for seniors and children Industry-wide training and professional standards to ensure quality Number of jobs created in this industry Increase in number of working women 	<ul style="list-style-type: none"> Increases women’s participation in paid work



GOAL 3.3

Promote Pune as a centre for innovation by focusing on creativity, research and development

WHY?

A city like Pune, which is transitioning from an economy that has heavy reliance in a few sectors (like autos and IT), is at risk of falling behind if it is not able to adapt and innovate in new sectors especially in more high productivity services. For it to do this and support new and emerging sectors, it needs to be able constantly reinvent itself. In this new world, innovation, information, research, and creative industries are integral to staying ahead of long term trends. If Pune is to realise its potential in innovation and creativity, it will need to make investments in higher research and create a better enabling ecosystem for the same.

This goal focuses on reducing those barriers, setting up systems for information sharing, and making better use of Pune's cultural and creative assets as part of its longterm economic resilience strategy.

SUSTAINABLE DEVELOPMENT GOALS



HOW?

ACTION 3.3.1

Create pathways for transfer of knowledge and technology between industries, research institutions, and universities

ACTION 3.3.2

Promote collection, storage and dissemination of quality open-data, in a privacy-emboldening way

ACTION 3.3.1

Create pathways for transfer of knowledge and technology between industries, research institutions, and universities

Research and innovation is important but ultimately holds its highest value when it is shared and flows freely between institutions where it can be practically used. This means creating better and stronger connections between industry, researchers, and universities. These institutions can be complementary but their different styles, goals, and personnel can be barriers for effective collaboration and for allowing businesses and individuals to translate new research into new products and services. In some Western countries like the United States, corporates reach out to universities/institutions to bring innovation into their work, while in India, corporates and industry bodies rely mostly on their own research. Thus there needs to be the right incentives and mechanisms for such collaboration to take place.

While Pune is an educational hub and has several industrial clusters like pharma, IT, and auto, it has not contributed to its full potential towards research and innovation. Compared to cities like Bengaluru, Kolkata, Mumbai, Delhi, Chennai and Hyderabad, Pune lags behind in research and professional practice indicators of - number and quality of publications, number of patents filed, and footprint of projects and professional practices. Thus Pune needs to focus on developing its R&D with public-private partnerships, strengthen university incubation centers and their linkages with MSMEs and industry sectors, focus on outcome-based research, faculty development programmes, and improve cognitive learning in schools.

Leads: Pune University and MCCIA

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
Strengthen 'Centre for Innovation, Incubation & linkages' at Pune University <i>Led by Pune University Institution Entity On-going Medium-term</i>	To promote innovative startups through the university ecosystem by facilitating ideas/innovations that are useful to the society and address problems faced through development of product, processes and services	<ul style="list-style-type: none"> No. of collaborations with industries/ MSMEs/Start-ups No. of faculty and students working on industry projects No. of high networked individuals and experts as mentors 	<ul style="list-style-type: none"> Fosters a culture of problem-solving, innovation, and entrepreneurship in universities Provides a platform for industry and academia collaboration
Initiate an innovation vouchers program for MSMEs <i>Led by MCCIA Program/Proposed by Resilient Pune/Medium-term</i>	To support MSMEs that aim to develop a product/service/process but don't have funding to support research or lack in-house expertise. These would receive a nonrepayable grant to avail innovation support services by universities/research institutions in the Pune urban region	<ul style="list-style-type: none"> Number of voucher recipients per cycle INR value of grant funding per cycle Grantee satisfaction of services provided based exit surveys 	<ul style="list-style-type: none"> Fosters a culture of problem-solving, innovation, and entrepreneurship in universities Provides a platform for industry and academia collaboration
Support 'Innovation & Technology Transfer Cell' and 'Innovation Promotion & IP Facilitation Cell' at MCCIA <i>Led by MCCIA Institution Entity On-going Medium-term</i>	To identify technology/processes (developed by research institutions/universities) that are ripe for commercial exploitation and make it available to the end users (MSMEs/start-ups)	<ul style="list-style-type: none"> No. of technologies sought from knowledge centres & made available to end users No. of patents filed No. of detailed project reports created INR amount in public and private investments 	<ul style="list-style-type: none"> Efficient transfer of technology Encouraging & developing entrepreneurship Encouraging R&D and innovation Catalyzing growth of MSMEs through technology transfer
Develop more R&D centres like those of Volkswagen, Marquardt, etc. <i>Led by Private Sector Institution Entity On-going Medium-term</i>	To create a local R&D base that will ensure that products are designed for the Indian market as against customising global products for Indian buyers	<ul style="list-style-type: none"> No. of jobs created No. of patents filed Rate at which R&D teams develop production-ready products i.e. 'throughout' INR amount invested in R&D centres 	<ul style="list-style-type: none"> Creating university to employment pathways Creating high-skilled jobs Attracting investments Promoting localized innovation Developing industry clusters

ACTION 3.3.2

Promote collection, storage and dissemination of quality open-data, in a privacy-emboldening way

In Pune, like other cities across India, data that is collected is siloed and often not shared, leading to a fragmented data landscape that exacerbates information gaps. Data is also collected in formats that are not functional for analytical purposes, and especially lack visualizations that can otherwise help recognize spatial and temporal trends; resulting in inaction or delayed action. Though Pune has created an open data platform and appointed a Chief Data Officer, compliance of various departments needs to be enforced with adequate training and capacity building.

Further, the global question of data-privacy demands a national adoption of data protection regulation which makes data sharing to be done in a privacy-friendly way; where the capability to trace the data to individuals is made through ‘anonymisation’. This should in no way shift away from the agenda of open-data, which is - to raise transparency and accountability, to gauge the performance of public authorities, contribute to choices in policymaking, and spur research and innovation.

Leads: NIUA Resilience Unit, MCCIA and Tata Trusts

Resilience-building projects

Project	Objective	Success Indicators	Resilience Value
<p>Learn from ‘PMC Open Data Initiative & Store’ Pilot</p> <p><i>Led by PMC & Tata Trusts City-wide Platform On-going Short-term</i></p>	To ensure data that is collected with the deployment of public funds is made readily available to the public	<ul style="list-style-type: none"> Structured data to allow automated processing Available to anyone without discrimination and in a timely manner 	<ul style="list-style-type: none"> Increases transparency and accountability Open format is pertinent to innovation building
<p>Permanently institutionalize ‘Pune City Data Officer: Driving Data Driven Governance in Municipal Systems’</p> <p><i>Led by PMC, Tata Trusts & Tata Consultancy Services City-wide Human Resource On-going Medium-term</i></p>	To create dedicated resource within the city administration, and work with the senior city leadership to tap the potential of municipal datasets to drive data-driven decision making	<ul style="list-style-type: none"> Quality data sets are publicly available under Open Data Policy of Government of India Capacity building of departmental officials on data standards is conducted 	<ul style="list-style-type: none"> Seeds a data culture within the municipal corporation
<p>Embolden and support India’s ‘Personal Data Protection Bill, 2018’</p> <p><i>Led by Justice BN Srikrishna Committee National Legislation On-going Short-term</i></p>	To make individual consent central to data protection, collection, storage, and purpose of collection. The types of data include personal data, sensitive personal data, biometric data; financial data, genetic data, and personal health data.	<ul style="list-style-type: none"> Data ownership is clarified, when held by both public and/or private entities Data breaches can be readily reported 	<ul style="list-style-type: none"> Provides a legal provision to operationalize the fundamental right to privacy in data use
<p>Create an ‘Open Data Observatory’</p> <p><i>Led by NIUA Resilience Unit City-wide Platform On-going Short-term</i></p>	To create a repository for accurate and frequently updated spatial and non-spatial data that can be used as a decision support system	<ul style="list-style-type: none"> Data serves as a decision support system, resulting in informed urban planning and policy Data visualization is used to communicate the importance of spatial factors Data is used to facilitate public participation in planning processes 	<ul style="list-style-type: none"> Allows decision makers, business, institutions, and citizens to visualize trends and analyze data in order to make decisions and to develop effective strategies



Image courtesy: google.com



IMPLEMENTING RESILIENCE

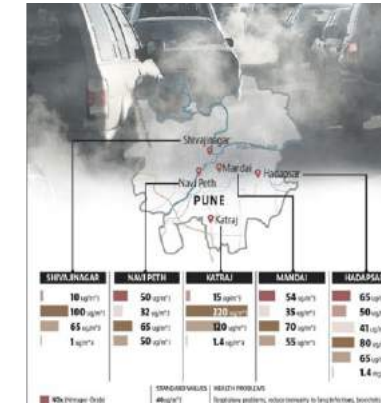
The creation of the strategy is the beginning of the resilience building work in Pune. Through this process we have convened a resilience ecosystem in Pune, created champions within and outside the Pune Municipal Corporation (PMC) to lead this work, and introduced a resilience lens to ongoing projects under the PMC and those by our partners in the city.

We will begin implementing the strategy with seven identified pilot projects (described in this section). Each pilot project aligns with one or more goals in the strategy. We are now working with project leads, potential partners, and donors to develop these further.

We invite all government, business, academic, and community sector organisations in Pune to join the resilience movement in the city. We invite all government, business, academic and community sector organisations in Pune to join the resilience movement in the city; and pledge to build their capacities, to understand and manage vulnerabilities, interdependencies and risks for everyone in the city. By making this commitment, we will all ensure continuity and safety for our customers, employees and local communities during shock events and address the underlying stresses that are wearing our systems down. This will help us demonstrate innovation and market leadership, and improve the wellbeing and prosperity of our citizens.

1. Pune Sustainability Monitor

To localize SDGs for Pune City & create monitoring capacity within PMC

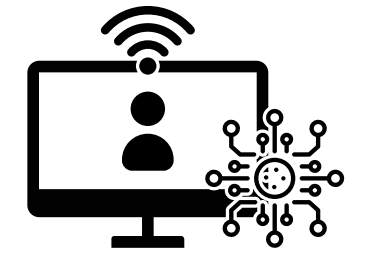


Annual Environment Status Reporting



Develop a Sustainability Framework for Pune by localizing the SDGs

PHASE 1



Create a digital platform for Sustainability Monitoring

PHASE 2

Potential Lead: PMC Environment Department

Potential Partners: United Nations Global Compact (UNGC)

Objective

- To expand the scope of the mandatory annual Environment Status Report (ESR) prepared by the PMC environment department, to include SDGs 2030

Potential Activities

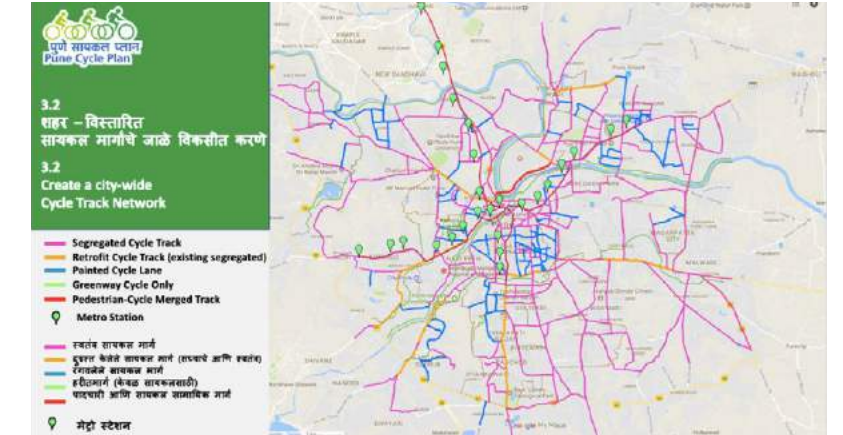
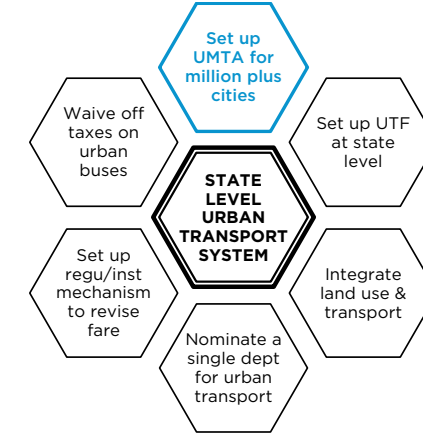
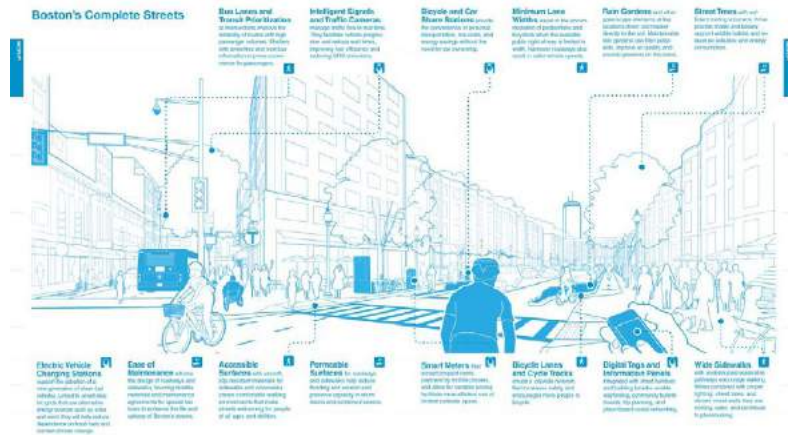
- Develop a Sustainability Framework for Pune, based on customized KPIs, amalgamating international, and local knowhow and best practices
- Enable reporting on progress on the targets adopted by the city using this Framework and strengthening setting up the required data collection mechanisms
- Through consultative processes, use the monitoring information for reviewing ongoing developmental programmes, and for developing and implementing new projects towards achieving the selected goals and targets
- Develop an online platform as a repository and for presenting the Sustainability Reports
- Institutionalize this monitoring process with adequate institutional and technical capacity at PMC in the form of a Sustainability Cell at PMC, regular presentation to local stakeholders, and reporting to national and international SDG monitoring processes

Resilience Value

The SDG-based monitoring framework will promote higher accountability, better performance assessment, and strong coordination among various local urban entities as well as include mechanisms for public dissemination of data and analytics

2. Move Pune

A comprehensive approach to mobility in Pune



1. TRANSIT-ORIENTED DEVELOPMENT HANDBOOK & MICRO-PLANNING PILOTS

Potential Lead: PMC
 Potential Partners: CEPT, Gokhale Institute of Political Economy

- Objective**
- To develop appropriate mechanisms for applying transit-oriented development and density-based transit planning principles in Pune
 - To conduct pilots of LAPs and TOD plans in a range of typologies of density and land-use, with a participatory approach, including for rejuvenation and conservation of core city precincts

- Potential Activities**
- Review and adapt existing materials such as the TOD handbook developed by CEPT for use in Pune, in the context of the state planning legislation (MRTP Act) and the service plans of public transport utilities (PMPML, Maha Metro)
 - Select suitable sites for pilot projects; these may include core city areas, and the 11 villages recently integrated into the municipal area (building upon the socio-economic and physical survey being conducted by Gokhale Institute)
 - Services planning may be done with PMPML and Maha Metro in addition to land-use planning as part of the LAP

Resilience Value
 Improved infrastructure for mobility and other essential services

Estimate Amount: INR 2 Crore*
Financing Source: MoHUA

2. PUBLIC OUTREACH & COMMUNICATION CAMPAIGN FOR MOBILITY

Potential Lead: PMC
 Potential Partners: ITDP, Parisar, CEE

- Objective**
- To strengthen PMC's capacity for IEC and public engagement on sustainable mobility
 - To implement sustainable mobility communication campaign
- Potential Activities**
- Undertake demonstration projects on public outreach and engagement, and use these to develop guidelines for public engagement in mobility planning in discussion with PMC staff
 - Enhance institutional capacity at PMC to facilitate outreach and public engagement through orientation events, and developing standards for tenders/contracts for transport projects
 - Commission the preparation of a communication strategy about PMC's sustainable mobility efforts (Rainbow BRT, Pune Streets Program, Pune Cycle Plan, Parking Policy, etc.)
 - Implement an extensive public outreach campaign in accordance with the communication strategy

Resilience Value
 Improved public understanding and support, greater political commitment, and improved designs of mobility plans and projects

Estimate Amount: INR 50 lakhs* for communication strategy development, INR 2-3 crores* for IEC implementation
Financing Source: MoHUA

3. PUNE UNIFIED METROPOLITAN TRANSPORT AUTHORITY (PUMTA)

Potential Lead: PMRDA, PMC
 Potential Partners: PCMC, Maha Metro, PMPML, Police, Transport for London, Rocky Mountain Institute, and civil society organizations such as ITDP, Parisar, CEE

- Objective**
- To ensure coordinated planning and implementation of sustainable mobility infrastructure and services with multi-modal integration across the metropolitan region
- Potential Activities**
- A PUMT committee has recently been set up. As next steps, a process may be set up:
- To conduct workshop(s) of the various land-use and transport planning entities in the PMR, as well as technical, academic and civil society organizations, for alignment of vision and plans and to identify planning and infrastructure gaps in adherence to national policies for sustainable mobility
 - To design an appropriate institutional structure, with guidance of entities such as Transport for London, for coordination between different agencies, to meet the objectives of sustainable mobility
 - To prepare draft legislation for the consideration of the state government to constitute a full-fledged PUMTA

Resilience Value
 Improved planning and infrastructure design for sustainable mobility

Estimate Amount: INR 50 lakhs*
Financing Source: MoHUA, MoRTH

4. CAPACITY BUILDING OF PMC STAFF FOR NON-MOTORIZED TRANSPORT (NMT)

Potential Lead: PMC
 Potential Partners: Parisar, Save Pune Traffic Movement

- Objective**
- To enhance technical capacity of PMC staff in Traffic, Road and related line departments on non-motorized transportation planning, development and review, and develop appropriate organizational procedures for the same
- Potential Activities**
- Pune has a Comprehensive Bicycle Plan and Design Guidelines. As next steps, the PMC staff at the Road Dept and associated departments need:
- Technical & field training for design of cycle network and tracks for different street situations, junction design for facilitating cycling, cycle-inclusive transportation planning
 - Exposure visits to learn from best practices

Resilience Value
 Improved planning and infrastructure design for pedestrians and cyclists

Estimate Amount: INR 50 lakhs*
Financing Source: MoHUA

*Amount will be revised upon creation of final scope of work

*Amount will be revised upon creation of final scope of work

3. Ecological Pune

Strengthening the environment resource base of the city



1. GROUND WATER

Potential Lead: PMC, GSDA

Potential Partners: ACWADAM, Mission Groundwater

Objective

- To improve knowledge about groundwater resources in Pune, develop a citywide strategy to protect recharge zones, improve recharge, and devise sustainable use strategies with the participation of the public

Potential Activities

Study/Strategy

- Prepare Pune Aquifers Map
- Create a ground water action plan & regulatory policy

Learning Pilots

- Based on aquifer map, protect natural recharge and discharge zones
- Create public water harvesting and recharge structures

Advocacy/knowledge

- Develop methods for citizens science and community-based participatory groundwater management

Resilience Value

Maintains and enhances aquifers to provide a buffer for water supply for the city

Estimate Amount: INR 1 crore*

Financing Source: PMC, CSR sources

2. NALLAS

Potential Lead: PMC

Potential Partners: 2030 Water Resources Group, CEE, Ecological Society

Objective

- To develop a policy for stream rejuvenation, building upon efforts such as the Osho Nalla Park, and support projects for nalla rehabilitation and treating waste water run offs

Potential Activities

Study/Strategy

- Prepare guidelines for nalla restoration

Learning Pilots

- Test 3-4 nature-based technologies (bio-remediation) in select nallas to demonstrate treatment and rejuvenation

Advocacy/knowledge

- Create a campaign for cleaning and greening of nallas

Resilience Value

Restores natural streams to continue to provide rainwater drainage, groundwater recharge and biodiverse, green spaces in the city

Estimate Amount: INR 2 crores*

Financing Source: PMC, CSR sources

3. SOLID WASTE

Potential Lead: PMC, SWaCH and CEE

Potential Partners: Adar Poonawala Clean City Initiative, UN Foundation

Objective

- To set up ward level management systems, appropriate institutional capacity, and physical systems towards 100% in situ, decentralized organic waste processing, eliminating organic waste in the municipal waste streams

Potential Activities

Study/Strategy

- Prepare city-level zero waste management policy

Learning Pilots

- Select a ward for 'Zero Waste' pilots to build capacity of residents and SWaCH waste collectors for segregation at source
- Treat solid waste locally at ward level

Advocacy/knowledge

- Study to set up an EPR Desk (extended producer responsibility) for difficult-to-recycle materials

Resilience Value

Enhanced recovery of recyclable materials, increased composting, reduced pollution from waste dumping, and improved occupational health and livelihoods of waste service providers

Estimate Amount: INR 3 crores* per administrative ward (for 3 years)

4. BIODIVERSITY

Potential Lead: PMC

Potential Partners: Research institutions, Biospheres, Ecological Society, and other NGOs, BVIEER and other colleges with Life Sciences and Biodiversity programmes, The Nature Conservancy

Objective

- To develop a scientific, evidence-based understanding of the current status, benefits and issues related to ecosystems and biodiversity in Pune, and prepare conservation and sustainable use management plans

Potential Activities

Study/Strategy

- Expand People's Biodiversity Registrar
- Create Biodiversity Strategy and Action Plan

Learning Pilots

- Adopt a biodiversity heritage site for conservation and promotion of species, habitats and corridors

Advocacy/knowledge

- Collaborate on creating a natural history museum/ecological learning
- Create guidelines for locally-appropriate plantation and greening

Resilience Value

Promotes social cohesion, community stewardship, and improves natural assets that reduce physical vulnerability of city systems

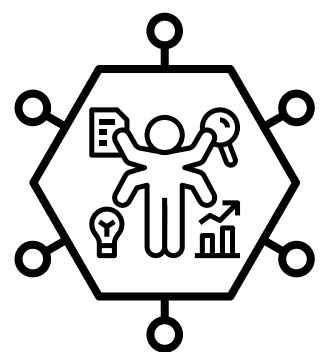
Estimate Amount: INR 3 crores*

*Amount will be revised upon creation of final scope of work

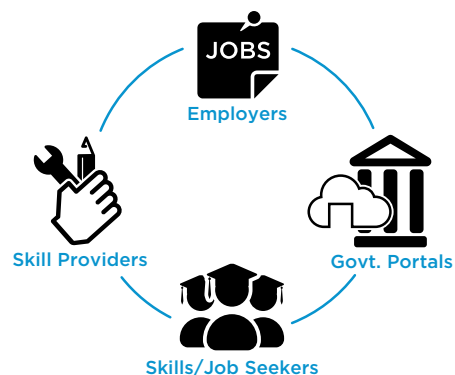
*Amount will be revised upon creation of final scope of work

4. Pune Skills World

Enhancing pathways from skill training to employment



PHASE 1: SKILLS MAPPING



PHASE 2: DIGITAL PLATFORM



An open university which will evaluate and accord credits, and become a degree-granting institution, will be explored in the future

PHASE 3: OPEN UNIVERSITY

PHASE 1: SKILLS MAPPING

Potential Lead: PMC Social Development Department
Potential Partners: Gokhale Institute

Objective

- To identify the gap between skills demanded by current and future industry needs, and those supplied in the Pune urban region

Potential Activities

- Identify existing and new high potential sectors in Pune based on a screening framework (market size, new jobs added, revenue potential for government, etc.)
- Assess gap in skills within the value chains of the industry

Resilience Value

Create baseline data to make informed decisions on design and investments in skilling programs

Estimate Amount: INR 25 lakhs*

Financing Source: PMC Budget 2019-2020

PHASE 2: DIGITAL PLATFORM

Potential Lead: Pune City Connect
Potential Partners: Pune Municipal Corporation

Objective

- To establish a digital platform to bring together skill providers, employers, government initiatives, and skill/apprenticeship seekers. Set up as a PPP between PMC and Pune Lighthouse, the platform would allow Pune-kars to gain credits for their skill qualifications and work experience, and link them to suitable academic tracks

Potential Activities

- Provide demand-driven skilling programmes
- Connect to industry partners for apprenticeships
- Provide certification/accreditation

Resilience Value

Provide pathways for vocational education to employment

Estimate Amount: INR 10 crores*

Financing Source: PMC Budget 2019-2020 (Pending Standing Committee approval)

5. Enterprise Pune

Promoting MSME growth in Pune



Potential Lead: Industry Associations in Pune Urban Region, Pune University

Potential Partners: Enterprise Singapore, Global Alliance for Mass Entrepreneurship (GAME), Universities, deAsra Foundation, Pune Ideas Factory Foundation, MCCIA, and MIDC

Objective

- To promote MSME growth by focusing on raising firm productivity, spurring innovation and building business capabilities by offering good low-cost business consulting services, legal aid, research/innovation support from universities/research institutions and partnerships

Potential Activities

- Enterprise Pune Capability Development Block Grant - a financial assistance programme that helps enterprises upgrade by covering up to 70% of the projected costs, which may include consultancy, manpower, training and certification
- Innovation voucher program - MSMEs that aim to develop a product/service/process but don't have funding to support research or lack in-house expertise, will receive a non-repayable grant to avail innovation support services by universities/research institutions in the Pune urban region
- Intellectual Property Intermediary (IPI)

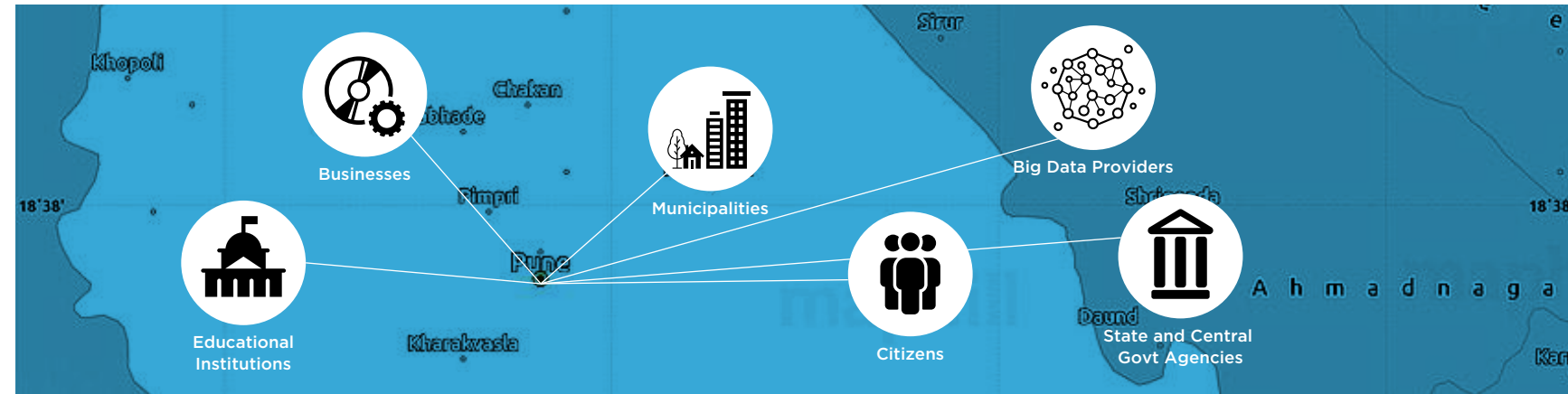
Resilience Value

Increase in number of enterprises and their productivity in Pune, will increase employment, incomes, and will expand the city's tax base

*Amount will be revised upon creation of final scope of work

6. Pune Data Observatory

A repository of accurate & frequently updated city specific data for decision support system



Potential Lead: Resilience Unit at National Institute of Urban Affairs (NIUA)

Potential Partners: PMC, MCCIA

Objective

- The proposed data observatory is a platform which will serve as a repository for accurate and frequently updated city specific spatial and non-spatial data that could be used as a decision support system. It will help eradicate data gaps that plague decision makers

Potential Activities

Operationalizing an urban data observatory will require a framework to guide stakeholders about decision making and the right tools to set up the physical center and virtual observatory

- Develop a physical centre with staff that will be responsible for collection and collation of data on a regular basis
- Connect government departments and agencies, citizens, big data providers, businesses and research/education institutions via a virtual platform, to share and access data
- Onboard visualization and management tool options with their providers, for operationalizing the data observatory

Resilience Value

It will allow decision makers, business, institutions, and citizens to visualize trends and analyze data in order to make decisions and to develop effective strategies

7. Area Sabha Pilots



Potential Lead: PMC, CEE

Potential Partners: SWaCH, UN Foundation

Objective

- To develop a policy, guidelines and capacities for public participation and set up a model for operationalizing the Area Sabha provision of the Maharashtra Municipal Corporations Act

Potential Activities

Formal forums such as an Area Sabha, analogous to the 'gram sabha', are needed to enable participation. These are envisaged under the Maharashtra Municipal Corporations Act, but not yet operationalized.

- Develop a policy and guidelines, and conduct orientation for municipal officials on public participation and the Area Sabha provision in Pune
- Undertake pilot programs to set up and conduct area sabhas in one or more areas / wards of Pune, linking to PMC's annual Participatory Budget process, developing a team of facilitators, and conducting ward studies to inform participatory processes, and process documentation

Resilience Value

Promotes social cohesion, community stewardship, and transparency and accountability in governance

Estimate Amount: INR 3 Crores



APPENDIX

STEERING COMMITTEE

Dr. Anand Chiplunkar
Former Director, Urban Development and Water Division (Central and West Asia Department), Asian Development Bank (ADB)

Dr. B.B. Ahuja
Director & Professor
College of Engineering, Pune (COEP)

Dr. Ganesh Natarajan
Chairman
Pune City Connect (PCC)

Mr. Ganesh Sonune
Head, Disaster Management Dept.
Pune Municipal Corporation (PMC)

Mr. Kiran Gitte, IAS*
Metropolitan Commissioner & CEO PMRDA

Mr. Mahesh Harhare
Pune Chief Resilience Officer (CRO)
100 Resilient Cities (100RC)

Ms. Mukta Tilak
Mayor
Pune Municipal Corporation (PMC)

Mr. Naval Kishore Ram, IAS*
District Collector
Pune District

Ms. Nayana Gunde, IAS*
Chairperson & Managing Director
PMPML

Prof (Dr.) Nitin Karmalkar
Vice-Chancellor
Pune University

Mr. Prashant Girbane
Director General
Maharatta Chamber of Commerce, Industries & Agriculture (MCCIA)

Prof. Rajas Parchure
Officiating Director
Gokhale Institute of Politics & Economics

Ms. Rashmi Shukla, IPS**
Commissioner
Pune Police

Mr. Saurabh Gaidhani
Associate Director
100 Resilient Cities (100RC)

Mr. Saurabh Rao, IAS*
Municipal Commissioner
Pune Municipal Corporation (PMC)

Mr. Shrikant Paranjape
President
CREDIA-Pune Metro

Dr. Swati Mujumdar
Pro-Chancellor
Symbiosis Skill & Open University

Mr. Vidyadhar Deshpande
Former Director Town Planning and Valuation, Urban Development Dept,
Govt. of Maharashtra

Mr. Yogesh Mulik
President of Standing Committee
Pune Municipal Corporation (PMC)

Former members who participated in the 1st Steering Committee meeting

Mr. Ashok Morale
DCP, Traffic Police

Mr. Kunal Kumar, IAS*
Former Municipal Commissioner
Pune Municipal Corporation (PMC)

Non members who participated in the 1st Steering Committee meeting

Mr. Adwait Sawarkar
Chief Minister's Fellow
PMRDA

Mr. Amreet Narang
Chief Minister's Fellow
PMRDA



Mr. Ashish Agarwal
Project Implementation Unit (PIU)
Pune Municipal Corporation (PMC)

Mr. Gojare
Executive Engineer, PMC

Mr. Indrabhan Randive
Executive Engineer. PMC

Ms. Jeenal Sawla
Consultant
Dalberg Advisors (Strategy Partner)

Mr. Michael Berkowitz
President & Managing Director
100 Resilient Cities Network (100RC)

Mr. Sharan Thandalam
Program Manager
100 Resilient Cities Network (100RC)

Mr. Varad Pande
Partner
Dalberg Advisors (Strategy Partner)

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CEE

Anand Chiplunkar
ex-Asia Development Bank

Aniruddha Pawasar
PMC- Building Permission/DP Dept.

Anshul Gujarathi
Eco Solutions

Ashok Ghodpade
Pune Municipal Corporation (PMC)

Ashish Agarwal
PIU-PMC

Ashwin Naik
Ashoka Foundation

Avadhi Patni
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Avinash Madhale
CEE

Ayush Killa
McKinsey & Co.

Bidisha Sikia
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PIU-PMC

Ganesh Natarajan
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Ganesh Sonune
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Harshita Jay
Samagra

Jagdish Khanore
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Kamlesh Yagnik
City of Surat

Karik Upadhyay
APCO Worldwide

Kartikeya Sarabhai
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Kunal Kumar
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Lucas Jannsen
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Prassana Desai
PVP college

Pratima Joshi
Shelter Associates

Prerna Saini
Eco Solutions

Rahul Bakare
Urdhvam-Water Management Experts

Ravindra Jaybhaye
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Richa Sharma
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Ruchi Mathur
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Rutuja Date
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Sanjay More
PMC

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DIALOGUES ATTENDED

Key takeaways

1. 100RC APAC Region - Implementation Training, 10-12 July 2018, Singapore

Pune CRO participated in this convening along with two officials of Pune Municipal Corporation- Mr. Mangesh Dighe, Environment Officer and Mr. Ganesh Sonune, Assistant Municipal Commissioner. Pune had taken up Mula Mutha River Project for the convening. It was great opportunity for the CRO and PMC officials to connect with peer cities like Melbourne and Singapore. These cities shared their experience on river management, ways of addressing challenges and adoption of sustainable design. Pune's work in mobility and solid waste management was found to be useful for Accra city from Ghana.

3. 4th Asia-Pacific Forum on Urban Resilience and Adaptation - Resilient Cities Asia Pacific Congress 2019 (RCAP 2019), 15-16 April 2019, - by ICLEI

Pune CRO was one of the panelist on 'Transformative actions to enhance urban resilience: Experiences from India and beyond'. The CRO shared his experience and the city's journey in developing the Resilience Strategy and the challenges it faced. He further highlighted the need for institutionalizing the resilience process within municipal system, identifying and nurturing the champions within the government system who will steer the resilience building process and create ownership by making provision in the city budget for taking up key actions identified under the Resilience Strategy.

5. World Cities Summit 2018, 8-12 July 2018, Singapore

- The biennial World Cities Summit is an exclusive platform for government leaders and industry experts to address liveable and sustainable city challenges, share integrated urban solutions and forge new partnerships.

2. City XChange, 20-24 May, 2018, Bellagio, Italy

The Summit used a combination of plenary sessions designed to improve mutual understanding of each other's priorities and outlooks, and small cross-sector working group sessions built around real challenges faced by participating cities. The information and problem details provided by cities including Pune helped inform outreach and selection of startups and other potential tech participants. Pune has taken up Solid Waste Management as a problem statement, for which select startups showed interest in supporting the city. The offering is to further develop a platform and tool to monitor waste flow within entire solid waste management value chain.

4. Sustainable Urbanization Planning Workshop at Pune, 15 & 16 May 2019, organized by India- European Union Partnership on Smart and Sustainable Urbanization and National Institute of Urban Affairs (NIUA)

- Various stakeholders deliberated on need for sustainable urbanization in Pune focusing on urban planning, environment and climate change, social housing and slum rehabilitation, innovation and mobility. Pune CRO along with other members in the group gave recommendations on improving the environment and addressing climate change challenges in the Pune Metropolitan Region.
- The recommendations around all these key aspects for the PMR area will be shared by the International Urban Cooperation (IUC), EU-India with the state government of Maharashtra and other donor agencies seeking their financial support.

- Pune CRO was panelist on Resilience thematic track. He said 'until we can align technical, political and financial conversations, we cannot have transformation. The role of the Chief Resilience Officer is to bridge these gaps to build resilience.'

ABBREVIATIONS

100RC	100 Resilient Cities
ADB	Asian Development Bank
BMC	Brihamumbai Municipal Corporation
CPCB	Central Pollution Control Board
CRO	Chief Resilience Officer
DA	Discovery Area
GOI	Government of India
GST	Goods and Services Tax
IAS	Indian Administrative Service
IFC	International Finance Corporation
IPS	Indian Police Service
JICA	Japan International Cooperation Agency
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
LBT	Local Body Tax
MAHA-METRO	Maharashtra Metro Rail Corporation Limited
MCGM	Municipal Corporation of Greater Mumbai
MH	State of Maharashtra
MIDC	Maharashtra Industrial Development Corporation
MoEFCC	Ministry of Environment, Forest and Climate Change
MOHUA	Ministry of Housing and Urban Affairs

MPCB	Maharashtra Pollution Control Board
MSEDCL	Maharashtra State Electricity Distribution Company Limited
MSRTC	Maharashtra State Road Transport Corporation
NHB	National Housing Bank
NSS	National Sample Survey
PBS	Public Bicycle Share
PCMC	Pimpri-Chinchwad Municipal Corporation
PIU	Project Impementation Unit
PMC	Pune Municipal Corporation
PMPML	Pune Mahanagar Parivahan Mahamandal Ltd
PMRDA	Pune Metropolitan Development Authority
PP	100RC Platform Partner
SP	100RC Strategy Partner
SRA	Slum Rehabilitation Authority
TOD	Transit-Oriented Development
WB	World Bank
MahaRERA	Maharashtra Real Estate Regulatory Agency
CREDAI	The Confederation of Real Estate Developers Association of India





Join us in building a Resilient Pune!

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