

CHENNAI RESILIENCE ACCELERATOR: FORGING PARTNERSHIPS

A call for support to potential donors and partners

RESILIENT CHENNAI

2019



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CITY CONTEXT



Fort St. George, Madras, 1797 | Engraved by Thomas Daniell



Katihipara Junction, Chennai 2010 | © Pratik Gupte

From a cluster of fishing villages in the 16th Century to the fourth largest metropolitan area in India today, Chennai has come a long way. The city's economy boasts a GDP of USD 58 billion and a growth rate of 6%. Chennai's economy has diversified substantially over the past two decades. It now includes the automobile and Information Technology industries, the healthcare industry, financial services, post-secondary educational institutions and a manufacturing sector producing various types of hardware. The city is a key player in the state and national economies: it contributes 60% to Tamil Nadu's manufacturing sector and produces 60% of India's automotive exports. Furthermore, as India's 'software as a service' capital and the most preferred destination for medical tourists from within India and abroad, Chennai has achieved important global status.

This trajectory of development and diversification has, on the one hand, made the city vibrant and cosmopolitan. On the other hand, it has invited a range of challenges: uneven development, which has aggravated risks faced by vulnerable communities; rapid and unplanned growth, which has resulted in water body encroachment, waste mismanagement and an increased impact of natural disasters. Compounding all of this is the nature of Chennai's governance system: the system tasked with addressing these myriad and interconnected challenges is characterized by multiple actors with overlapping, and sometimes unclear, mandates and jurisdictions.

RESILIENT CHENNAI STRATEGY – THE JOURNEY

In 2014, Chennai was selected as one of the second cohort of cities for the 100 Resilient Cities programme, providing the right opportunity for the city to start addressing its challenges in a holistic manner and incorporating resilience thinking into the city's future development path. Since 2017, when Mr. Krishna Mohan Ramachandran was selected as the Chief Resilience Officer, he and his team have been working tirelessly with over 3,300 Chennai residents, experts, activists and government officials to develop the Resilient Chennai Strategy.

In this journey, the team has conducted multiple citizen surveys that included people from all walks of life, working group meetings with experts from all sectors, and one-on-one interviews with representatives from government, civic, and corporate agencies. The team carried out thorough research on all the priority areas of focus, namely,

- **Unhealthy and Unplanned Urbanization**
- **Water Systems**
- **Civic Engagement**
- **Vulnerable Communities and Informal Settlements**
- **Governance**

These focus areas were identified by city stakeholders (in the first phase of work) for deep dives to gain a comprehensive understanding of the interlinked nature of Chennai's resilience challenges.

Based on this stakeholder-driven, scientifically informed and rigorous process, the Resilient Chennai Strategy presents a range of ideas that city leaders from government, civic and industrial sectors can individually and/or collectively undertake to ensure the future resilience of Chennai's citizens and infrastructure (both natural and man-made), to key shocks and stresses in the city.

Namma Chennai Civic Engagement Survey

*Required

Solid Waste

Do you segregate waste in your residence? *

☐ Yes

☐ No

☐ Partially

If you do segregate, what sort of a system do you follow in your residence? *

Select NA if not applicable.

☐ Segregate and handover

☐ Segregate and compost wet waste

Namma Chennai Civic Engagement Survey



Mr. Amit Prothi, Head of India Strategy, 100RC, moderating a special Working Group meeting on Water issues



Participants at the Working Group meeting on Informal Settlements and Vulnerable Urban Groups

RESILIENCE FOR CHENNAI – THE VISION

Resilience is “the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience.” It is about “making a city better, in both good times and bad, for the benefit of all its citizens, particularly the poor and vulnerable” (<http://www.100resilientcities.org/FAQ/>).

This highlights resilience as not just a response to major shocks or negative events, or as limited to bouncing back to the status quo. Rather, it is about growing, transforming, and improving for the benefit of all. Therefore, resilience for Chennai is about building the city's inner strength to address its myriad everyday challenges that range from unhealthy urban growth to the poor state of the city's water bodies, exposure to extreme events like floods and droughts, limited coordination within the city's governance system, and high vulnerability of the already marginalized residents of the city to disasters as well as everyday stresses.

Drawing on stakeholder input, the **Vision of a Resilient Chennai** is to become:

Enlightened. Just. Integrated.

Enlightened, meaning that Chennai revives its deep historical relationship with water and grows while protecting and preserving its water bodies as an integral and priceless part of the urban fabric; where citizens take ownership and engage with civic issues to create public spaces that bring pride and joy, strengthening the city's vibrant cultural identity; where the city cultivates champions of change in schools and colleges by teaching its youth to respect the natural world, embrace diversity, live sustainably and believe that their voices do matter and can be heard.

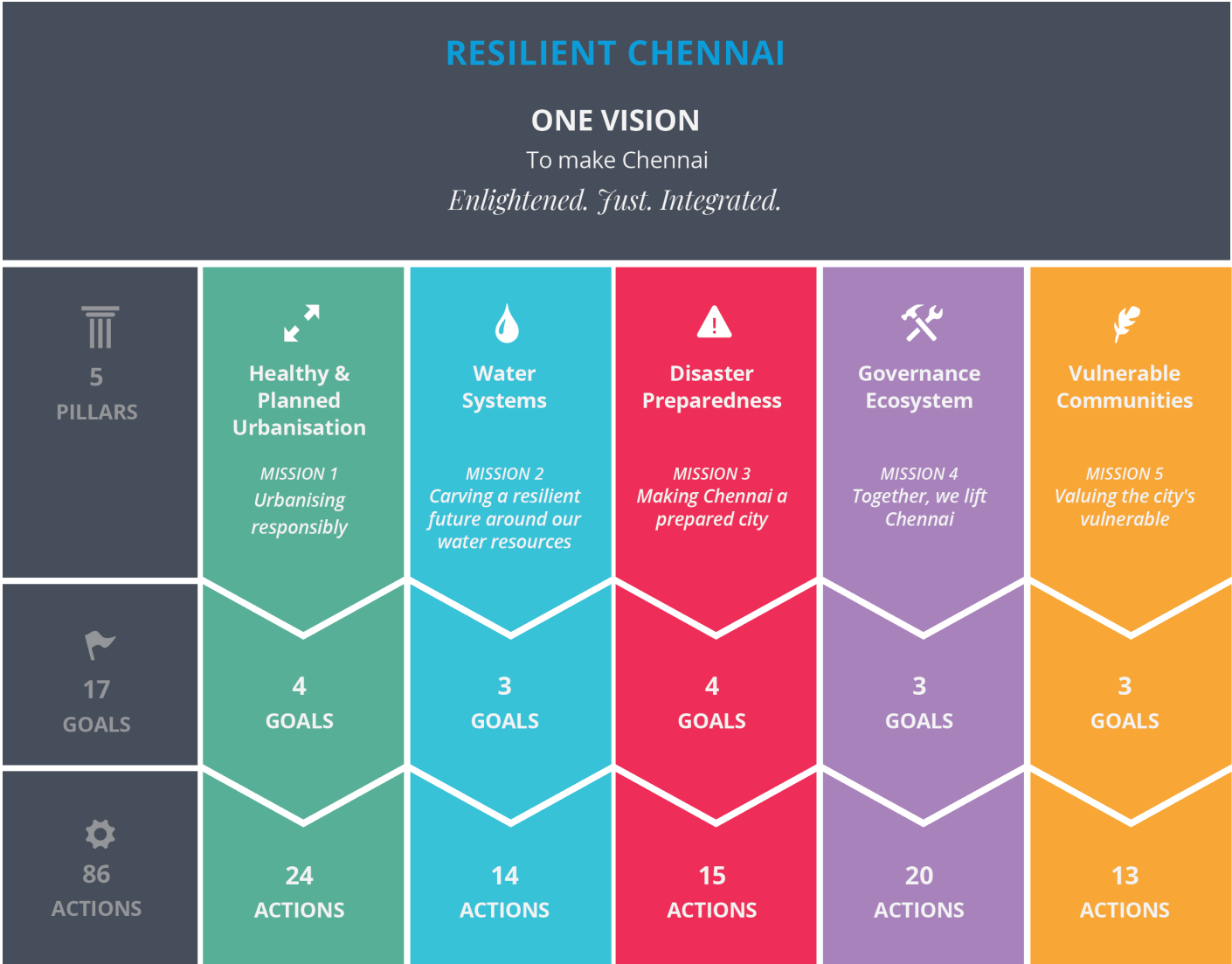
Just, meaning that the Chennai embraces its vulnerable communities and treats them as key stakeholders in resilience building, who contribute and benefit from resilience strategies; where participatory planning protects multiple interests and visions; where the city is designed to be equitable and inclusive, ensuring that the needs of all sections of society are met.


Integrated, meaning that Chennai’s leadership and governance have a ‘big picture’ view to make better informed and more efficient decisions; where the city's learnings are institutionalized and healthy engagement between and within stakeholder groups results in streamlined, integrated systems leading to improved outcomes with greater impact.

THE STRATEGY – A ROADMAP TO CHENNAI’S RESILIENCE

The Resilience Strategy is a leadership document to help city leaders from public, private and civic domains to collaborate and guide their organizations to respond to the key shocks, stresses and challenges of Chennai over a 5-year horizon. This strategy has built on the experiences and knowledge of multiple stakeholders from government, non-government, academic, civic, and private agencies and has been aligned to existing state, metropolitan, and city policy and planning documents. This is a resilience strategy of Chennai leadership, by Chennai leadership, for Chennai leadership, to work in partnership with citizens, government, and the private sector to translate strategy into action.

The Resilient Chennai Strategy is driven by a collectively defined vision to make Chennai Enlightened, Just and Integrated through five missions (defined by the five key resilience challenge areas identified by stakeholders), 17 goals, and 86 actions. The following table presents an overview of the strategic missions and goals.






GOAL 1.1 FOSTER RESILIENCE THINKING WITHIN THE URBAN PLANNING PARADIGM SO THAT AN INTEGRATED APPROACH IS USED TO ADDRESS ENVIRONMENTAL CONCERNS THROUGH POLICY AND DESIGN.

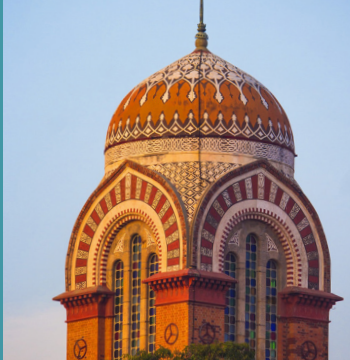
GOAL 1.2 ADDRESS SOLID WASTE RELATED CHALLENGES MORE EFFECTIVELY.

GOAL 1.3 ENCOURAGE A MORE MULTI-STAKEHOLDER DRIVEN URBAN PLANNING PROCESS.

GOAL 1.4 PROMOTE TRANSIT-ORIENTED DEVELOPMENT TO MAKE CHENNAI A WELL-CONNECTED, PEOPLE AND ENVIRONMENT-FRIENDLY CITY.




GOAL 2.1 FOSTER RESPONSIBLE WATER USAGE.



GOAL 2.2 GIVE PRIMACY TO WATER RELATED CHALLENGES IN URBAN DESIGN EFFORTS.

GOAL 2.3 ENSURE BETTER COORDINATED EFFORTS BETWEEN PUBLIC, PRIVATE AND CIVIC AGENCIES TO RESTORE AND PROTECT WATER BODIES (INCLUDING THE SURVIVING Erys).



GOAL 3.1 LEVERAGE DATA AND TECHNOLOGY TO COPE WITH DISASTERS MORE EFFICIENTLY.

GOAL 3.2 SPECIFICALLY ADDRESS CHALLENGES FACED BY VULNERABLE GROUPS LIVING IN DISASTER PRONE AREAS.

GOAL 3.3 SUPPORT SMALL AND MEDIUM SCALE BUSINESSES THROUGH A COMBINATION OF ECONOMIC AND NON-ECONOMIC MEASURES TO HELP THEM COPE BETTER WITH DISASTERS.


GOAL 3.4 BUILD CAPACITY ACROSS GOVERNMENT & COMMUNITY TO BE BETTER PREPARED IN THE EVENT OF DISASTERS.




GOAL 4.1 IMPROVE EFFICIENCY TO HANDLE RESILIENCE CHALLENGES BY ENABLING KNOWLEDGE TRANSFER ACROSS GOVERNMENT AGENCIES.


GOAL 4.2 STRENGTHEN CURRENT PRACTICES OF ENFORCEMENT AND MONITORING.

GOAL 4.3 FOSTER AN ENVIRONMENT WHERE GOVERNMENT, CITIZENS AND MARKET INTERESTS CO-BUILD THE CITY'S RESILIENCE.





GOAL 5.1 BRING DIVERSE VULNERABLE COMMUNITIES INTO MAINSTREAM POLICY MAKING BY IDENTIFYING THE DIFFERENT GROUPS AND THEIR NEEDS.



GOAL 5.2 ENSURE THE INTEGRATION OF VULNERABLE GROUPS INTO THE URBAN FABRIC, WHILE MEETING BASIC NEEDS FOR ADEQUATE HOUSING.

GOAL 5.3 ENSURE A MORE HUMANE PROCESS OF PROXIMATE RESETTLEMENT OF INFORMAL SETTLERS WHEN NO OTHER OPTION EXISTS.

WORK THAT WE CAN DO TOGETHER

In this document we wish to present those actions from the Resilient Chennai Strategy that we believe have great potential to contribute towards Chennai’s resilience building effort and could be readily taken up for implementation with support from interested donors. Given the spectrum of projects, they have been classified into four crucial themes:

1. Data-driven Governance	2. Integrated Water Management	3. Sustainable Waste Management	4. Disaster Preparedness
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DATA-DRIVEN GOVERNANCE

- A. Chennai Data Observatory

B. Multi-hazard data collection

C. Resource centre on the invisible to inform policy

D. Vulnerability mapping for industrial areas
- E. Water Restoration Dashboard

F. Web-based platform on water-centric urban design

G. Platform for collective-action best practices

A. Chennai Data Observatory

The Resilient Chennai Team is facilitating discussions between the National Institute of Urban Affairs (NIUA), Chennai Smart City Limited (CSCL), Madras Chamber of Commerce and Industry (MCCI) and Centre for Urbanization, Buildings, and Environment (CUBE), Indian Institute of Technology, Madras (IITM) to set up a data observatory that will serve as a repository for accurate and frequently updated, local, spatial and non-spatial data that can be used as a decision support system for Chennai city. The observatory will collate relevant information from all departments involved in Chennai city governance, including the Greater Chennai Corporation (GCC), Chennai Rivers Restoration Trust (CRRT), Chennai Metropolitan Development Authority (CMDA), Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) and the Tamil Nadu Slum Clearance Board (TNSCB), and will consist of both a physical data centre and a virtual platform.

Outcomes:

- a. The role of the physical centre will include coordination between different stakeholders to collect data, frequently update data, train staff on data management, develop models for scenario planning and develop a learning centre to educate public officials about data-driven planning.
- b. The role of the virtual platform will be to analyse and represent collected data through searchable maps, tables and other forms.
- c. The virtual platform will also allow users to learn from and interact with each other through blogs and discussion forums. All government departments who contribute data will have access to it through the data centre.

Link to City Resilience: Data availability, data sharing, and data-driven decision-making are important aspects of good governance. Therefore building resilience in the way the city functions, manages its resources (land, water, waste etc), provides for its citizens (including those who are vulnerable) and plans for its future depends on up-to-date and quality data. The data observatory will offer the city's public and private agencies and citizens with this relevant knowledge resource and ensure that the generated data is utilised to improve service provision, alleviate day-to-day stresses and use real-time data to manage shocks as they emerge.



TIMEFRAME
Short term: 1-2 yrs




STATUS
New / Proposed

KEY PLAYERS

NIUA, CSCL, CUBE, MCCI, Resilient Chennai

B. Multi-hazard data collection

 **TIMEFRAME**
Short term: 1-2 yrs

 **STATUS**
Ongoing
(Needs strengthening)

KEY PLAYERS

TNSDMA, Revenue and Disaster Management Department, Public Works Department (PWD), CMDA, GCC, IITM, Anna University (Remote Sensing Department), National Centre for Coastal Research, Indian National Centre for Ocean Information Services (INCOIS), Indian Meteorological Department (IMD)

The Resilient Chennai Strategy recognizes the need to invest in collaborative efforts to collect and analyse quality and accurate data in order to map and assess the most significant disaster risks for Chennai city. The first step in mitigating disaster risks is to have the right data on likely threats (droughts, tropical cyclones, storm surges, earthquakes and tsunamis) and on regions and communities that are at risk from these threats. Therefore, through a multi-hazard mapping exercise, different types of data will be collected, including precipitation, surface and groundwater levels, soil moisture, stream flows and sea surface temperature. According to the Tamil Nadu State Disaster Management Plan (TNSDMP), the Government of Tamil Nadu has announced that it will establish a Geographical Information System (GIS) cell, within the Revenue and Disaster Management Department, for risk and hazard assessment. This cell will also be integrated with early warning systems and other decision support systems. Since some of the data is already available, or is being collected by different departments and organisations, collaborations across government and private agencies will be critical.

Outcomes:

- The data will be spatially mapped and overlaid by data on socio-economic characteristics, resident access to various basic services such as water, sanitation and electricity to assess disaster risk and to create detailed GIS-based risk maps and hydrological models.
- This project will support government agencies like the Tamil Nadu State Disaster Management Authority (TNSDMA), and institutions like the Indian Institute of Technology, Madras (IITM) and Anna University to develop efficient early warning systems and make urban planning processes data driven.

Link to City Resilience: This action would help to effectively channel government resources in areas categorized as high vulnerability. Further, access to quality data will enhance disaster preparedness and aid in coordinating prompt post-disaster relief efforts.

C. Resource centre on the invisible to inform policy

 **TIMEFRAME**
Short term: 1-2 yrs

 **STATUS**
New / Proposed

KEY PLAYERS

Madras Institute of Development Studies (MIDS) and other research institutions, TNSCB, GCC, Tamil Nadu Housing Board (TNHB), the Department of Welfare for the Differently-abled, Information and Resource Centre for the Deprived Urban Communities (IRCDUC), the Spastics Society and Vidya Sagar

A resource/research centre can be set up to collect and analyse data and monitor trends around the entire range of vulnerable populations. The centre would create a comprehensive database on vulnerable populations including their demographic details, location, the socio-economic challenges they face and their access to basic services. This data centre would offer policy recommendations and help multiple government departments co-ordinate and converge on existing schemes such that they address the needs of all vulnerable groups more effectively.

Link to City Resilience: This project would be crucial in filling the data void on vulnerable communities in the city. While there is sufficient recognition of the needs of slum dwellers in public policy and research, a range of vulnerable groups, including the homeless, gender minorities, the differently-abled, elderly and others, remain largely invisible in this realm. Therefore, by providing the relevant data, the Resource Centre will ensure that government agencies address the needs of the many vulnerable groups in a more efficient and cohesive way, thus making the city more inclusive.

D. Vulnerability mapping for industrial areas

A comprehensive mapping exercise will be carried out in industrial clusters in Chennai to identify their level of vulnerability to water-related disasters. The flood and cyclone events in 2015 and 2016 crippled the industry sector in Chennai. This exercise will be crucial in identifying industrial clusters with high vulnerability and frame an adequate response to mitigate the impact of water-related disasters.

Link to City Resilience: This project will be crucial in building business's resilience and preparedness to water-related disasters and ensuring business continuity. Further, this exercise will provide the framework for planning disaster resilient industrial clusters in the future.

 **TIMEFRAME**
Short term: 1-2 yrs

 **STATUS**
New / Proposed

KEY PLAYERS

Micro, Small and Medium Enterprises (MSME) Department, TNSDMA, Resilient Chennai, CUBE, IITM, Anna University, CMDA.

E. Water Restoration Dashboard

A Chennai City Connect initiative is working on addressing coordination among water restoration efforts by developing an internet-based platform that is accessible to all.

Outcomes:

- The platform will provide details of all ongoing and completed efforts around water body restoration in the Chennai Metropolitan Region. It will also include details of location of effort, leading organisation(s) funding and involved in the effort and description of the work being done.
- In addition to ongoing efforts, the dashboard will also list agencies that have technical expertise, resources and interest in restoration efforts.

Link to City Resilience: This project will aid corporates in identifying relevant projects for their Corporate Social Responsibility (CSR) initiatives. Further, the database will connect and coordinate the efforts of interested stakeholders based on their area of expertise: Financial, Technical, Human Resource etc. The project will also help inform interested citizens/ RWAs who wish to take a more active role in restoration efforts in their neighbourhood.

 **TIMEFRAME**
Short term: 1-2 yrs

 **STATUS**
New / Proposed

KEY PLAYERS

Chennai City Connect, CRRT, GCC, CSCL, CMWSSB, Environmentalist Foundation India (EFI).

F. Platform on water-centric urban design

A web-based platform will be created for storing information on urban design projects that have incorporated water-sensitive elements like porous pavements, raingardens in parks and public spaces to mitigate the impact of floods and recharge groundwater aquifers. Targeted towards urban planners within government and interested citizens, this platform could be created by a consortium of architecture/design firms and research institutions and be hosted by CMWSSB. The website will include links to potential partners/funders looking to collaborate on similar work.

Link to City Resilience: The platform will serve as a crucial knowledge hub for disseminating innovations in water-centric design practices. For a city that is subjected to frequent and often alternating cycles of flood and drought, entrenching water-sensitive elements in urban planning can ensure that the effects of these events are not aggravated and can, instead, help in mitigating them.

 **TIMEFRAME**
Short term: 1-2 yrs

 **STATUS**
New / Proposed

KEY PLAYERS

Urban design firms working on sustainable and green design, academic institutions such as Anna University and IIT Madras

G. Platform for collective-action best practices



TIMEFRAME
Short term: 1-2 yrs



STATUS
Ongoing
(Needs strengthening)

KEY PLAYERS

Urban design firms working on sustainable and green design, academic institutions such as Anna University and IIT Madras, NGOs/civil society organisations, GCC

A website can be developed to highlight best practices around participatory governance and collaborative efforts around Chennai city civic issues. This website will act as a repository of best practices, categorized according to specific themes such as water, waste, disasters and responsible citizenship. The website will be linked to the water-sensitive urban design website and the urban data observatory.

Link to City Resilience: This website can act as a knowledge repository for collaborative best-practices around different resilience challenges around water, waste, disaster management etc. It can also inspire citizens, public departments, and private actors to initiate similar efforts across the city or reach out to those who have been successful in initiating relevant projects/programmes.



INTEGRATED
WATER
MANAGEMENT

- A. Lake Restoration—a guidebook
- B. Water as Leverage (WaL)
- C. Capacity building programme for sustainable building practices

A. Lake Restoration—a guidebook



TIMEFRAME
Short term: 1-2 yrs



STATUS
New / Proposed

KEY PLAYERS

CRRT, GCC, PWD, CMWSSB, CSCL, EFI, TNC, IIT Madras

The city needs to define a set of guidelines that will direct multiple lake restoration efforts that are currently underway, such that they address hydrological problems using a people-centric approach and specify various steps involved in restoration. The guidebook can be developed by NGOs active in lake restoration efforts and technical experts from academic institutions in coordination with the relevant public agencies.

Outcomes:

- a. This document would be a primer for local government, NGOs and CBOs, engineers and technical experts and organisations looking to intervene.
- b. It would include details on hydro-geological, economic, ecological, socio-cultural and other factors that need to be considered in the restoration process.
- c. It would also contain information on what should be achieved by restoration efforts and the role of stakeholders in the process.

Link to City Resilience: This guidebook will first and foremost develop a common understanding of the restoration process for all parties to follow. Furthermore, this guidebook would help in recognizing the interlinked system of water bodies in the city and understanding the spatial distribution of waterbodies being restored. This will result in a more efficient way of reviving inter-connected waterbodies and amplify their role in water conservation and flood management, rather than restoring isolated water bodies with minimal impact. Further, this would support greater coordination and collaboration among government, citizens and private companies for lake restoration efforts.

B. Water as Leverage (WaL)

Chennai is one of three target cities for the 'Water as Leverage for Resilient Cities Asia' project which was launched at the UN Climate Conference COP23 in Bonn, Germany. Its overall purpose is to foster collaboration across public, private and civic agencies to identify sustainable solutions for water related challenges that can be scaled up and that can act as leverage points for addressing the multitude of resilience challenges faced by the city. In Chennai, the WaL project aims to tackle the city's water challenges in an innovative and inclusive way.

Outcomes:

- a. Incentivising local stakeholders to introduce a series of nature-based solutions including onsite grey water treatment and ground water recharge systems;
- b. Plugging solid waste and sewage dumping into water bodies;
- c. Demonstrate the effectiveness of ground water recharge to combat droughts and floods.

Link to City Resilience: WaL inspired projects will showcase how to effectively integrate water conservation in urban design and planning. Further, the programme will provide access to an array of international experts which can be beneficial to study successful water conservation practices worldwide and customise them in a way that is relevant to Chennai's urban planning landscape. Investing in the WaL projects will be a crucial step towards building resilience of the city's water system.

C. Capacity building programmes for sustainable building practices

Chennai's academic institutions and urban design firms with expertise in green and clean infrastructure and design can initiate capacity building programmes that a) train urban planners in the CMDA and GCC and b) train real estate developers on how to include environment and water friendly designs in urban planning. The programme can essentially consist of a series of workshops where participants are exposed to various available sustainable design practices and learn how these can be incorporated into their work.

Outcomes

- a. Through the workshops, participants will also have the opportunity to consult with the Counselling and Consultancy Centre at CMDA (free of charge) on design related elements of their proposed projects.
- b. These plans may include redesigning existing parks, public spaces and buildings or developing new sites which showcase environment friendly solutions.
- c. Ultimately, these plans can also be developed into detailed project reports (DPRs) that can be implemented by interested agencies.

Link to City Resilience: The training programme will improve the skillsets and technical capacity of relevant stakeholders. Further, it will foster an environment where sustainable building practices are embedded in urban design and planning. Additionally, it would be an effective way to address water challenges through innovations in urban design.



TIMEFRAME
Short term: 1-2 yrs



STATUS
Ongoing
(Needs scaling-up)

KEY PLAYERS

GCC, Resilient Chennai, WaL teams, Urban design firms working on sustainable and green design, academic institutions such as Anna University and IIT Madras



TIMEFRAME
Short term: 1-2 yrs



STATUS
New / Proposed

KEY PLAYERS

CUBE, IIT Madras, Anna University, urban design firms, Care Earth, CMDA, CMWSSB, GCC, real estate developers



SUSTAINABLE
WASTE
MANAGEMENT

- A. 'Talking Trash' in schools
- B. Chennai Against Plastic (CAPS)
- C. Urban horticulture programme

A. 'Talking Trash' in schools



TIMEFRAME
Short term: 1-2 yrs



STATUS
Ongoing
(Needs scaling-up)

KEY PLAYERS

GCC, CityWorks, Resilient
Chennai

CityWorks, a Chennai-based architecture firm, that is also committed to building greater awareness and capacity to support a sustainable urban life, will collaborate with Resilient Chennai to sensitise and train school children on the environmental impacts of poor solid waste management practices and encourage them to act as change agents in their families and communities. The programme will initially be implemented in three GCC schools and will use the "Trashonomics" book developed by Solid Waste Management Roundtable (SWMRT), Bangalore for the training.

Outcomes:

- a. Address the problems of mismanagement of waste by giving simple and practical solutions with colourful illustrations, slogans, facts and hands-on activities.
- b. Cultivate champions and agents of change in schools and colleges through a curriculum that instils a greater sense of civic consciousness.

Link to City Resilience: This action would help make citizens take greater responsibility for the waste they generate and bring about a behavioural change in waste generation and waste disposal practices. Further, it would educate students about the risks their city faces, mainly around waste mismanagement and encourage a culture of environmental awareness from a young age.

B. Chennai Against Plastics (CAPS)



TIMEFRAME
Short term: 1-2 yrs



STATUS
Ongoing
(Needs scaling-up)

KEY PLAYERS

CityWorks, Resilient
Chennai

The CAPS website was launched in January 2019 to create awareness about the impact of unsustainable solid waste management practices and how citizens can do their bit to contribute to a greener future. However, thus far, it has generated little interest among city residents, as it lacks information on ongoing efforts and how citizens can reduce their solid waste footprint. Therefore, CityWorks will collaborate with the founders of CAPS to strengthen the existing website.

Outcomes:

- a. Bridge the gap between citizens who want to make a change in SWM but lack proper know-how to do so.
- b. Help citizens realize that resources and knowledge base already exist in the city, and that with the help of these resources, small steps can be easily taken to address the city's SWM challenge.

Link to City Resilience: This action would help in establishing a comprehensive knowledge repository of effective ways to manage waste generated and making citizens take greater responsibility for the waste they generate. By addressing solid waste issues in the city, this action will contribute to mitigating the city's resilience challenges related to waterbody pollution, ground water and soil contamination, consequent public health risks, choked storm water drains and other natural drainage channels, flood risk etc.

C. Urban Horticulture programme

This programme presents an innovative way of embedding 'green infrastructure' into the city by establishing rooftop vegetable gardens in government schools to start with. Initiated by Resilient Chennai in partnership with the GCC, this programme seeks to set up rooftop gardens in government schools within each zone and scale it up to model localities through RWAs.

Outcomes:

These gardens will help address multiple goals such as:

- a. Providing access to fresh, nutritious, organic produce which can supplement the Government of Tamil Nadu's "nutritious meal" programme for school children;
- b. Keeping the environment clean through segregating at source and using organic waste as compost in the gardens;
- c. Reducing temperatures and the need to transport produce, thereby saving fuel and lowering CO2 emissions;
- d. Offering an opportunity for citizens to engage positively and proactively with civic issues, and allow young people to channel their energy constructively;
- e. Providing a lab for innovative approaches to urban development by showcasing good governance in action.

Link to City Resilience: The urban horticulture programme presents an opportunity for government, citizens and private actors to work together on the ground to address civic issues, build public awareness on benefits of gardening, and support sustainable solid waste management through waste segregation and composting. Scaling up this effort can go a long way towards building the city's resilience to such chronic stresses as poorly managed waste, limited citizen awareness of and participation in city's governance and civic issues, access to affordable and healthy food, while also indirectly mitigating flood risks by managing the city's solid waste better.



TIMEFRAME
Short term: 1-2 yrs



STATUS
New / Proposed

The programme has secured partial funding through Chennai Smart City Limited (CSCL)'s 'Model and SMART Corporation Schools in Chennai' project.

KEY PLAYERS

GCC, CSCL, Department of Horticulture and Plantation Crops, Tamil Nadu Corporation for the Development of Women (TNCDW), and NGOs such as The Magic Bean, Indra Gardens and My Harvest



DISASTER
PREPAREDNESS

- A. Comprehensive Disaster Response Plan
 - i. Mapping Community Infrastructure for Resilience
 - ii. Building Disaster Awareness
 - iii. First Responder Training Programme
 - iv. Sensitive Post-disaster Relief

A. Comprehensive Disaster Response Plan

Differently-abled people, children, women, the elderly and low-income communities are some of the population segments that are typically more affected by disasters. Reduced impact, quick and efficient disaster response and increased preparedness is required for these segments and can be achieved by formulating a comprehensive disaster response plan which includes information on emergency shelters, contact numbers, dos and don'ts, for before, during and after disaster events.



TIMEFRAME
Short term: 1-2 yrs



STATUS
New / Proposed

Continued overleaf >

KEY PLAYERS

GCC, RWAs, NGOs, Anna University's Centre for Climate Change and Adaptation Research, other academic institutions, industry associations, media groups, the District Collector's office, Indian Red Cross, Bhoomika Trust, Blue Cross of India

The disaster readiness plan can potentially include the following four crucial elements which in themselves are worthy interventions to build Chennai citizens' resilience to disaster:

I. MAPPING COMMUNITY INFRASTRUCTURE FOR RESILIENCE

Communities can equip themselves for effective and quick disaster risk reduction. The key to this lies in investing in community infrastructure that is durable and safe; for example, community halls and shelters on elevated grounds, storage spaces for key assets, maintaining clear escape routes for rescue/relief operations and evacuation. Some of this infrastructure already exists. Therefore, the city could create a comprehensive map of existing community assets to identify locations where new assets are needed, specifically in areas that are prone to floods and/or storm surges.

II. BUILDING DISASTER AWARENESS

In most cases, communities lack the knowledge required for effective risk reduction. Therefore, a widespread and sustained awareness campaign could be carried out to build community capacity to anticipate and cope with disasters. Campaign elements would include:

- Awareness on a range of climate (cyclones, floods, droughts) and non-climate (earthquakes, industrial fires, oil spills, epidemics) risks to the city, with an understanding of vulnerable areas and communities likely to be at higher risk;
- Based on the GCC's 2018 Chennai Disaster Management Plan, create awareness around what to do during a disaster, emergency contact information and relief centre locations;
- Awareness on insurance and economic tools that communities and business can leverage to protect themselves.

III. FIRST RESPONDER TRAINING PROGRAMMES

Local volunteer-led organizations already play a critical role in responding quickly to disasters through rescue and relief efforts. This was evident during the December 2015 floods, when large groups of people collaborated on social media platforms to provide relief, so much so that it caught the attention of several local and international dailies. The city can tap into these existing resources to designate local risk managers who could organize, either as individuals or as groups of individuals, to act as first responders to assist in search and rescue efforts, transportation arrangements and providing first aid, shelter and relief (food, water and sanitation) and animal rescue. These groups would be trained to work with the office of the local district collector and GCC, to coordinate with government and complement their efforts.

IV. SENSITIVE POST-DISASTER RELIEF

- Providing sensitive and quick disaster relief that is appropriate to the needs of different vulnerable groups, based on assets and livelihood losses;
- Assessing losses both in terms of life and property and in terms of key documents (e.g. voter ID, school records and property title deeds) and restoring these critical resources more effectively;
- Providing safe spaces where people and animals can take shelter in the event of disasters, such as community halls/shelters on elevated grounds, and ensuring that they are accessible to all, including the elderly and people with disabilities;
- Providing storage space for key assets;
- Building the capacity of government personnel (including National Disaster Response Force and State Disaster Response Force) to recognize the diversity of vulnerable communities and provide appropriate, humane, and sensitive relief.

This plan, and supporting programmes, could potentially be incorporated into the GCC's Chennai Disaster Management Plan.

Link to City Resilience: This plan and the associated programmes would help vulnerable communities protect themselves during a disaster. It would also help data collection on disaster impact which can be fed into mapping tools for more efficient disaster management, urban planning, and governance. Further, it will garner citizen engagement in managing the city's disaster risks thus building their own capacity to cope with disasters.

CALL TO ACTION

Enlightened. Just. Integrated.

Going forward, Chennai city leaders and citizens will need to continue to make concerted efforts to translate the Resilient Chennai vision into action. While the strategy identifies potential leading agencies for each of the actions, all interested citizens, community-based organizations, industries and government agencies are invited to come forward and take ownership of these resilience actions.

HERE ARE SOME WAYS ONE CAN CONTRIBUTE TO BUILDING A RESILIENT CHENNAI:

EXPLORE

- 1 Visit the Resilient Chennai website to learn more about the development work around this strategy and around progress made on current initiatives involving the Resilient Chennai team. www.resilientchennai.com



SHARE

- 2 Share information on ongoing efforts that support, align and add to this strategy. This information will be showcased on the Resilient Chennai website.



SPEAK UP

- 3 Reach out to Mr. Krishna Mohan Ramachandran, the Chief Resilience Officer (CRO), by email to share your inputs and thoughts on building city resilience. cro@resilientchennai.com



COLLABORATE

- 4 Express interest to collaborate: tell us if you or someone else you know can help initiate certain actions. cro@resilientchennai.com



WALK THE TALK

- 5 As the city incorporates a resilience lens into its planning and actions, we will collectively and individually need to contribute to city resilience by doing our bit, every day. This includes keeping our city clean, abiding by rules and regulations, and protecting our environment—all, while respecting the vulnerable.



THANK YOU FOR MAKING CHENNAI RESILIENT.

CHENNAI CITY RESILIENCE STRATEGY 2019

