



INDIAN INSTITUTE FOR  
HUMAN SETTLEMENTS

Cases@IIHS

EXPLORING CASE-BASED LEARNING

# Urban health and climate resilience a case of Surat City, India

Anuj Ghanekar, Dr Vikas Kishor Desai





# Urban health & climate resilience: a case of Surat City, India

---

**Anuj Ghanekar**  
**Dr Vikas Kishor Desai**

**IIHS Case No. 1-0034**

DRLA Case Studies | 2018

**Case Teaching Note**

**Case Narrative**

**First published in Bengaluru, 2019.**

**Suggested citation for this case is:**

Ghanekar, A. & Desai, V.K. (2019). Urban health and climate resilience: a case of Surat City, India. IIHS Case No 1-0034. Bangalore. Indian Institute for Human Settlements.



## **This section contains**

- I. IIHS Case Method
- II. Case Preface Note
- III. List of Case Contents
- IV. Teaching Note



# I. IIHS Case Method

The IIHS case is a work-in-progress that represents experiments in different forms of creating interdisciplinary and inter-sectoral cases, as well as a diversity of pedagogical environments to learn and teach with these cases. The opening set of cases is, thus, also in a sense, an experiment in form and teaching modes. Given this, we do not claim a singular 'IIHS Case Method' or any one form or definition of a case. Indeed, one of the explicit aims of case development at IIHS is to challenge conventional ideas of what case-based learning is. How then does a user know how to use cases? Pedagogical transactions will differ from case to case and indeed multiple options will be open within each case. Therefore, in order to aid users, all IIHS cases come with a set of consistent elements that help users navigate through the diversity of form and content.

These are:

- **Preface:** Every case begins with an introduction by the case writer that describes their own approach to the case. How did the case writer frame the case? Why did they choose to structure it as they have? What were their intentions in writing the case?
- **Teaching Note:** The second shared case element is the Teaching Note. Here, the case writer lays out their imagination of how they would teach with the case in its current form. They suggest learning outcomes, pedagogical modes, learning environments and assessment frames. True to the diversity of the cases, each of these is particular to the case.
- **The Main Case:** This is the main body of the case—its core empirics, arguments, discourse and data. Across the cases, these come in different forms: PowerPoint presentations, audio-visual material, web interfaces, written text, and data visualizations.
- **Pedagogical Possibilities:** The next element lays out the case writer's suggestions on other ways in which the case could be taught, including in other disciplines or learning environments. These are not as detailed as the Teaching Note but offer a set of possibilities to the user to imagine other uses of the case than those laid out.
- **Case Archive:** The final element of the case is a library of documents—reports to interview transcripts, unedited footage to visual photo libraries—that act as an archive for the case. This repository allows users to also access a host of background and additional information necessary to navigate the larger contexts in which the case is situated.

Each IIHS case—regardless of the diversity of its form—comes structured with these elements. It is our hope that this recognizable framework will enable users to navigate easily across cases with very diverse elements and forms.

### III. Case Preface Note

Resilient cities show maturity of processes in handling disasters as well as climate induced health impacts. Disaster resilience leadership is often spontaneously demonstrated at macro levels (such as city administration) as well as micro levels (such as a small neighbourhood). Resilience can be more effective if spontaneous efforts are formalised in systematic actions and institutionalised platforms. Systematic actions can involve evidence generation for action and advocacy with city governments as well as communities, capacity building of stakeholders, networking and building alliances in routine, and documentation of institutional memories of handling disasters and traditional community knowledge of adaptation.

The fourth fastest growing city of India, Surat shows high climate change vulnerability. Repetitive floods, river side city location, changing rainfall pattern, city limit extension and high population density, highest immigrant population, rapid industrial development activities, high disease burden (vector borne, and water borne), and native resurgent infections make city vulnerable for climate change and health hazards. The city has experienced 23 river floods in last 100 years. Surat also faces local flooding (called Khadi floods) from two streams that pass through the southern part of the city. Delayed monsoons and prolonged summers are directly affecting population health. Indirect impacts occur through changes in the range and intensity of infectious diseases, food and waterborne diseases, and changes in the prevalence of diseases associated with air pollution. In the 1960s, Filariasis was a major public health challenge in the city followed by Malaria in the 1990s. In the recent past, the city has experienced two resurgent infections post flood period- Plague in 1994 and Leptospirosis between 2006 and 2013.

Surat has also shown a remarkable ability in learning from its a few decades-long experiences of dealing with various disasters. The initial phase of spontaneous leadership actions was later followed by leadership facilitating the systematic partnerships between various stakeholders including the city government, academia, citizens, NGOs, funding agencies, expert groups and the private sector. One leadership example is the setting up of an institutionalised body- the Urban Health and Climate Resilience Centre (UHCRC).

UHCRC works like a climate and health observatory for city government and community. Systematic vulnerability assessment studies and action advocacy, demonstration of climate and health action models, capacity building of urban practitioners and community – these are some of the roles UHCRC continues to play. Further, the demand of convergence in urban resilience, such as holding together the multiple city actors who otherwise tend to work in silos, is being fulfilled by UHCRC.

Within disaster resilience leadership initiatives, such efforts **in routine** are needed and possible besides rescue and recovery efforts **during the disaster** itself. Understanding the role of leadership by initiatives like UHCRC has significant policy relevance to help design systemic interventions that can nurture leadership towards creating resilient cities. Local practices if documented well, can generate the global significance.



Being the unique initiative for 'urban' and connecting dots of climate and health, the case of UHCRC has been chosen.

This case can help learners to understand what particular role leadership has played in the journey of spontaneous leadership to systematic resilience actions using the UHCRC initiative, and how leadership is rooted in the culture of city itself. The case will refer the evolution of disaster resilience over the 1994 plague to the 2013 floods, time period and highlight the key principles in leadership that led to these changes.

The case is developed during a four-month period study that will consist of desk review (scientific investigations and press reports). Narratives of city stakeholders documented from archived and separate interviews will explore the principles for this leadership in city.

Participant observation in local workshops and meetings organised under this initiative during years 2013-2016 will strengthen the case. Experience of the case writer as being a part of UHCRC initiative is an inseparable methodological facet.

The case document and readings will address the historical context in terms of specific responses given to disaster incidents in context of socio-economic-cultural conditions of city.

*The case content is written primarily for teaching purposes and may have the author's own views which must not be construed as facts.*

# IV. List of Case Contents

## **Section A: Introduction to the Case**

1. Case Preface Note
2. Detailed Table of Contents
3. Teaching Note

## **Section B: Case Write-up**

1. Main case Write-up – “Urban health & climate resilience: A case of Surat City, India”

## **Section C: Case Archives**

1. Publications and literature as mentioned in the “Suggested Readings” section of the teaching note

# V. Teaching Note

**Case Title:** Urban health & climate resilience: A case of Surat City, India

**Case Trigger:** Climate induced health impacts in Surat city

**Case Objective:** To understand the process of institutionalization of climate and health resilience actions in a city

## A. Learning Objectives of the case

1. **To understand how a city can initiate urban climate and health resilience leadership in an institutionalised manner:** learners will be introduced to the process of multi-stakeholder collaborations in Surat across the last decade, which channelised the formation of UHCRC. They will be acquainted with stakes of each stakeholder – government and private, local and global.
2. **To acknowledge the need for a diversity of need-based activities and actors from multiple disciplines to achieve results at the city scale:** Learners understand the possibilities of actions that are needed and can be taken in this arena. The products generated (links shared in the main case) can be helpful to understand possible outcomes and what more can be done.
3. **To discuss the possible principles that can instigate disaster resilience leadership in cities:** The principles involve:
  - Convergence and formalising existing partnerships
  - Evidence based actions
  - Understanding cultural context and sharing-learning

The discussion will also involve other parallel examples in Surat (quotes and narratives) to understand how resilience leadership can be gradually rooted in city governance.

## B. Suggested Audience

The course is ideal for a class of 25 participants who could be undergraduate or post-graduate level students or practitioners from different disciplines, preferably public health, disaster management, management studies, public administration, development studies, environment studies, social science and urban planning. A prior experience in field-based work is preferable.

## C. Pedagogic trajectory

The suggested course format is a time-frame of seven days which can be further divided into three phases. If there are time constraints, the faculty could also decide to teach this over a one-day course, keeping the sequence of teaching aligned with the three phases.

Phase I: Developing the theoretical base (2 days)

1. Contextualisation i.e. understanding Surat city, understanding stakeholders

## 2. Strengthening the theoretical perspective about leadership and governance

Phase II: Understanding UHCRC formation and initiatives (2 days)

Phase III: Discussion on principles behind UHCRC formation and reflection (3 days)

*The extended course can also be designed incorporating Surat field visits.*

### ***Suggested Analytical Frameworks to understand leadership dimension:***

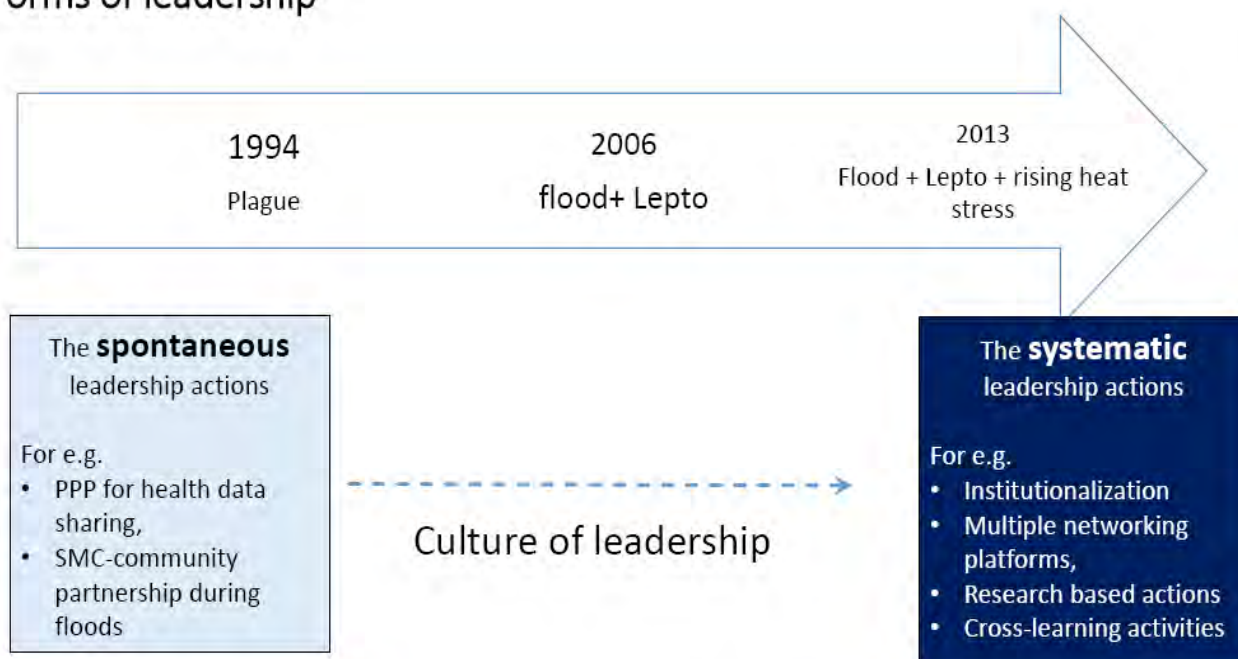
#### *Framework I*

Existing condition of vulnerability	Coastal city, river & urban flooding associated health threats like VBDs, high heat index, rapid city expansion & population growth, socio-economic equality, cultural diversity
Trigger of action	Past disaster experiences created culture of leadership through multi-stakeholder collaborations
Role	Public private partnership (formal), Member of the affected systems (informal)
Time of action	Preparedness and early warning planning
Scale of disasters	Intensive (e.g. flood) as well as Extensive (VBDs)
Form & Perception of leadership	Multiple actors organizing common interests & Learning from practice
Resources available	Operational (funds, networks) Cultural (City image, attitudes & behavior, Collaborations, history)
Processes of participation	At conception, design and implementation levels
Constraints	Agency constraints (operational guidelines, sustainability plan, power struggles, barriers for common agenda, defining boundaries)
Sustainability	Institutionalization and its effective functioning

#### *Framework II*

- The spontaneous leadership actions – especially during 1994 floods followed by the plague and then the 2006 flood
- The systematic leadership actions in terms of formal partnerships, availing the formal dialogue forums etc.

## Forms of leadership



### D. Learning Environment

The UHCRC initiative is relatively new and not well documented. However, there are quite a few publications with respect to disaster and resilience initiatives in Surat over the last decade. The case write-up is a narrative of the events over a decade which lead up to the formation of UHCRC and the actions taken henceforth. The first-hand information collected for this case consists primarily of oral histories from persons who were present in Surat and witnessed this process.

The recommended mode of teaching this case would be through blended learning self-paced/instructor-paced models, where the case write-up is provided to the learners to get familiarised with before the class. The in-class time is used primarily for discussion and analysis as described in the pedagogic trajectory. It is recommended to discuss the narratives in class to set the context, and to engage the learners through insights and experiences of the people who were involved in the case. This exercise is also useful for learners to visualise the context and actions which they have previously read about.

Further, depending on the length of the class, a list of discussion prompts are suggested below and can be used for debating in-class, personal reflection or as peer group discussions. It is left to the discretion of the instructor depending on the subject of course/ module, duration and class composition.

### E. Discussion prompts:

Apart from using some relevant prompts from the study's 'Questions of Enquiry', the faculty is encouraged to use the following prompts in the classroom to achieve the set-out learning objectives.

1. How does disaster context – multiple stressors matter in the development of resilience leadership? Can you compare Surat with any other city in India?
2. How does the ‘urban health’ lens matter in climate and disaster resilience? (importance of health as an outcome of events)
3. What can be the possible enablers for multi-stakeholder collaborations in disaster resilience context?
4. What conscious efforts urban practitioners can do to institutionalise disaster resilience leadership?
5. Discussion about UHCRC initiatives – links of products shared in main case – reading and discussion
6. Discussion about UHCRC principles – quotes and narratives to be used as discussion prompts (group discussion)
7. Institutionalising urban health and climate resilience in a hypothetical city – exercise
8. UHCRC sustainability – what would have happened if city authorities would not have taken leadership? What were drivers for sustainability?

## **F. Suggested Readings**

Surat Health Sector Study- India ACCCRN, 2011

Anguelovski I., Chu E., Carmin J., “Variations in approaches to urban climate adaptation: Experiences and experimentation from the global South”, *Global Environmental Change*, 27 pp 156–167, 2014.

Surat Climate Resilience Strategy, 2013



# Case Narrative



We thank Dr. Ashish Naik (Deputy Commissioner H & H and UHCRCE Trustee, Ms. Garima Jain, Mr. Sathish Selvakumar and Ms. Priyanka Jariwala for support in the process of case formation.”



## **This section contains**

- I. Case Summary
- II. Abbreviations
- III. Case write-up
- IV. References
- V. Exhibits





# I. Case Summary

The coastal city of Surat, in Gujarat, India faces multiple climate and health stressors. Socio-demographic stressors add into overall city vulnerability. Urban health resilience leadership in Surat has witnessed the journey from 'spontaneous actions' to 'institutionalised resilience'.

In this context, the Urban Health & Climate Resilience Centre (UHCRC) initiative in Surat emphasised evidence-based advocacy to Local Self-Government and demonstrated unique models of capacity building of various city stakeholders. The UHCRC project from 2013 to 2016 was an interdisciplinary research, training, advocacy and network project, the first of its kind in India under the execution of health department of Surat Municipal Corporation (SMC). The seed funding of a project was by the Asian City Climate Change Resilience Network (ACCCRN) of Rockefeller foundation.

The UHCRC formation process involved collaborations of stakeholders for the common agenda, sector specific studies and institutionalisation process under the leadership of Local Self Government. Key actions taken by the UHCRC included:

- Urban climate and health vulnerability assessment
- Heat & health action plan
- Advocacy for strengthening disease surveillance
- Community resilience action models- piloting

In order to ensure sustainability of activities, the Urban health and Climate Resilience Centre of Excellence (UHCRCCE) Trust was established which continued its work with other resilience activities since 2017.

Principles adapted by UHCRC in resilience leadership involve –

- Convergence and formalising the existing partnerships
- Evidence-based actions
- Understanding cultural context & sharing-learning

Interviews with city stakeholders reveal that these principles lie in overall historical experience of city. Several examples from climate and health sector actions over last two decades demonstrate these principles. Understanding the role of leadership by initiatives like UHCRC and their operation has a significant policy relevance, to help design 'systemic interventions' that can nurture leadership towards creating resilient cities.

## II. Abbreviations

<b>ACCCRN</b>	Asian Cities Climate Change Resilience Network
<b>CAC</b>	City Advisory Committee
<b>DMP</b>	Disaster Management Plan
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>RF</b>	Rockefeller Foundation
<b>SCCT</b>	Surat Climate Change Trust
<b>SGCCI</b>	Southern Gujarat Chamber of Commerce and Industries
<b>SMC</b>	Surat Municipal Corporation
<b>UHCRC</b>	Urban Health & Climate Resilience Centre
<b>UHCRCCE</b>	Urban Health & Climate Resilience Centre of Excellence
<b>UrSMS</b>	Urban Services Monitoring System
<b>VBDC</b>	Vector Borne Disease Control

# Case Write-up

## 1. Surat's vulnerability to climate change and health – context and triggers

Urban health resilience leadership in Surat is not merely an outcome of a single disaster episode or 'sudden shock'. It is leadership that emerged out of experience of multiple stressors faced by the city over decades. The journey of city from 'spontaneous actions' to 'institutionalised resilience' must be understood in context of its overall climate & health vulnerability.

### Socio-demographic stressors

*(Contribute to 'sensitivity' function of climate vulnerability as described in IPCC framework)*

Known as the fourth fastest growing city of the world<sup>1</sup>, Surat has a population of 44, 61, 026 (Census 2011). The city shows a 55.29% recent decadal growth rate and has a density of

13,680 persons per sq.km. Between 1951 to 2011, the area of the city increased by 326 sq. km and population rose by 41,00,000. Around 37% of the total population reside in slums and slum like areas<sup>2</sup>.

Surat is the city with highest in-migrant population across India<sup>3</sup>.

Being a diamond processing and trading hub, a textile hub and witnessing a high level of industrialisation, Surat can be estimated to be one of the world's fastest growing cities in the 2019-35 period, according to a global economic research report<sup>4</sup>.

People in Surat come from different traditions and cultures due to varied industries. This also brings in socio-cultural stresses like changes in social cohesion (increasing conflicts in routine), wide gap in socio-economic classes (escalating heterogeneity) and emerging changes in attitude and behaviour.

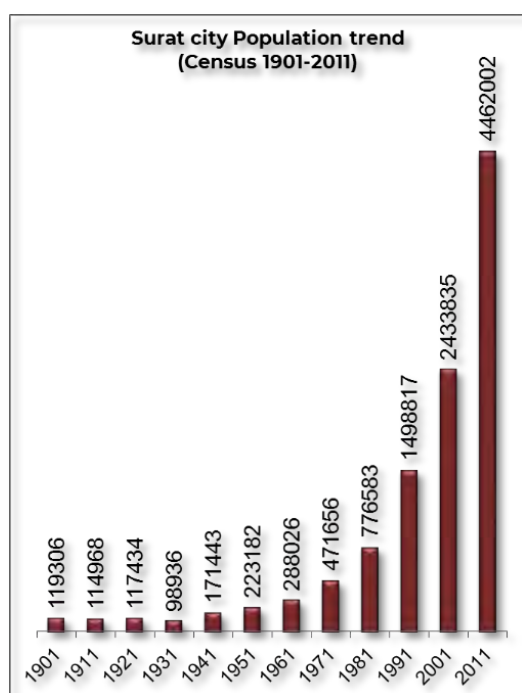


Figure 1: Surat city population trend (1901-2011)

<sup>1</sup>City Mayors Foundation. 2017. "The World's Fastest Growing Cities and Urban Areas from 2006 to 2020." [http://www.citymayors.com/statistics/urban\\_growth1.html](http://www.citymayors.com/statistics/urban_growth1.html). Accessed Jan 16, 2019.

<sup>2</sup>Statistics for Surat Municipal Corporation <https://www.suratmunicipal.gov.in/TheCity/Demographics>

<sup>3</sup>Santha, Sunil D., Surinder Jaswal, Devisha Sasidevan, Kaushik Datta, Ajmal Khan, and Annu Kuruvilla. 2015. "Climate Change, Livelihoods and Health Inequities: A Study on the Vulnerability of Migrant Workers in Indian Cities." Working Paper 16. London: International Institute for Environment and Development.

<sup>4</sup>Media coverage on Global Economic Research Report <https://www.livemint.com/Politics/2IIYvfG7jS7KKA6p8xeK/Surat-Bengaluru-Vijayawada-to-be-among-worlds-fastestgro.html>

## Climate change stressors and health outcomes

(Climate stressors majorly contribute in the 'exposure' function of climate vulnerability as described in IPCC framework<sup>5</sup> and further determine the health outcomes)

Surat is one of the twenty cities across the world most affected by climate change<sup>5</sup>. It is located on the banks of the Tapi River, which flows into the Arabian Sea, around 16 kilometres

Natural Hazard Typology & Surat city					
	Hazard	Direct risk for Surat	Geographical impact	Onset	Impact duration
Climatic	Sea level rise and coastal erosion	Yes	0	*	+
	Heat wave	Yes	0	*	+
	Draught	No	0	*	+
	Floods	Yes	0	*	+
	Cyclone	Yes	0	*	+
	Land slide	No	0	*	+
Tectonic	Tsunami	Yes	0	*	+
	Earthquake	Yes	0	*	+
	Volcanic eruption	No	0	*	+

Level of Geographical impact

0 = Global

0 = Regional

0 = Local

Onset

\* = rapid

\* = Sudden

Impact Duration

+

+

Figure 2: Surat's place in hazard typology

Surat is one of the twenty cities across the world most affected by climate change<sup>5</sup>. It is located on the banks of the Tapi River, which flows into the Arabian Sea, around 16 kilometres from the city centre. Much of the city and its surroundings are less than 10 metres above mean sea level. It is estimated that around 90 per cent of Surat's geographical area is affected by some type of climate hazard- either flooding, coastal storms and cyclones, or inundation high tides and sea level rise. These hazards have not all been experienced with the same intensity.

<sup>5</sup>Inter-Governmental Panel on Climate Change Working Group Reports <https://www.ipcc.ch/working-group/wg2/>

## Climate variability as seen in Surat<sup>6</sup>

### Floods

As Surat is located near the mouth of the river, high tides reach the western part of the city, with a tidal range of five to six meters. During the rainy season, high tides often inundate settlements located along several tidal creeks. The city has experienced regular floods and since 1914 (23 floods are on record). The risk to infrastructure, productive assets and households is likely to increase further.

### Delayed monsoon-Prolonged summers

Surat, being a coastal city, faces climate change impacts of increased temperature and humidity with urban heat island effects, and heat stresses due to high heat index. With prolonged summers, the water demands of the city are also nearing the allocated water resources. This increased demand for water and energy would need development of alternate sources. Surat also faces water quality issues due to algae and weed growth in river sources during summers, which is expected to increase during peak summers. Additionally, it also faces increased concentration of pollutants during lean seasons

#### Box 1: Flood stories narratives

*"In 2006, the estimated loss...the figures are very vague... but for practical purpose, the government, insurance companies, SGCCI (Southern Gujarat Chamber of Commerce and Industry) ... the estimated loss is 20000 crore rupees. Now this was the estimated loss in 2006 in terms of property loss, manpower and opportunity loss. So, this is definitely a sizeable loss by any standard." (sic)*

Former SGCCI President<sup>7</sup>

*"2006 was the devastating floods. We lost everything... No food, ration was left. Drinking water which was available was from the terrace water tank... and that sustained for a short period since (there was) one tank for one building.... No light, no cell phone... SMC (Surat Municipal Corporation) fire bridge used boats, and personnel from Ahmedabad telephone exchange commenced the telephone network within four days." (sic)*

Former Elected Representative & SCCT Trustee<sup>8</sup>

<sup>6</sup>Reading following documents will be useful to understand context and triggers –

1. Surat city Resilience Strategies (2010 & 2017)

[http://www.asiapacificadapt.net/sites/default/files/resource/attach/Surat\\_City%20Resilience%20Strategy\\_TARU-SMC.pdf](http://www.asiapacificadapt.net/sites/default/files/resource/attach/Surat_City%20Resilience%20Strategy_TARU-SMC.pdf)

[http://www.100resilientcities.org/wp-content/uploads/2017/07/Surat\\_Resilience\\_Strategy\\_PDF.pdf](http://www.100resilientcities.org/wp-content/uploads/2017/07/Surat_Resilience_Strategy_PDF.pdf)

2. Path to Resilience – A tale of two cities (a brief video)

<https://www.youtube.com/watch?v=KdXSzYcg3qA>

3. Resilience assessment – technical report

[https://www.researchgate.net/publication/307415680\\_Preliminary\\_Resilience\\_Assessment\\_of\\_Surat\\_City](https://www.researchgate.net/publication/307415680_Preliminary_Resilience_Assessment_of_Surat_City)

<sup>7</sup> Personal communication, (December 2015). Names of all interviewees have been withheld for privacy.

<sup>8</sup> Personal communication, (December 2015). Names of all interviewees have been withheld for privacy.

### Sea level rise

Surat faces landward intrusion of sea and salt water intrusion into aquifers. There is seasonal inundation of creek areas during annual high tide periods. There is also increased inundation risk to informal settlements located along creek.

### *Changes in cyclone frequency, not known yet.*

This can aggravate sea level rise impacts along creek flood plains in western part of the city

### *Urban growth (contributing to/by climate variability across the region)*

There is a push and pull migration which would necessitate focus on affordable housing in safe areas and flood resistant housing in less risk prone areas.

## Climate induced health impacts

Three broad categories of health impacts are associated with climatic conditions: impacts directly related to weather/climate, impacts resulting from environmental changes in response to climate change, and impacts resulting from consequences of climate-induced economic dislocation, environmental decline, and conflict. Changes in frequency and intensity of heat events and extreme rainfall events (i.e., floods and droughts) will directly affect population health. Indirect impacts will occur through changes in the range and intensity of infectious diseases, food and water-borne diseases, and changes in the prevalence of diseases associated with air pollutants and aero-allergens.

### **Box 2: Surat's climate & health vulnerability is often part of citizens sharing,**

*"Corporation organises pre-monsoon with us (private doctors). This takes care of monsoon diseases. Winter has comparatively healthy atmosphere in Surat. Then we need to counsel people for not getting sun-stroke when summer approaches. Season specific counselling is needed, for example, jaundice. Before monsoon, we alert people not to drink sugarcane juice and all. Prevention is better than cure. (sic)"*

Former President, Katargam-Ved Private Doctor's Association <sup>9</sup>

*"I recollect the images of some of the stresses in a city. One of the recurring things I can recall is of the rainfall and flood. As a child I remember how in a ground floor society, it always used to flood when you go out for the transport, or you have to walk in water. Every monsoon you have a problem of water logging and flooding...Also, I can recollect is the diseases of malaria related to it. It was quite common... when I was 17 or 18, it was very common. I myself remember- almost every year I used to get malaria. Then it started changing in a way, I remember I was getting more falciparum when I was 18. And I think this was also the time public health experts know, that can be more migrants coming from different states of India and then this falciparum P.F. cases were really increasing (sic)".*

Academician, Centre for Social Studies, Surat<sup>10</sup>

<sup>9</sup> Personal communication, (July 2018). Names of all interviewees have been withheld for privacy.

<sup>10</sup> Personal communication, (December 2015). Names of all interviewees have been withheld for privacy.



*"Climate change can have even indirect impacts on health which need to be studied. For example, citizens suffering with non-communicable diseases like diabetes, hypertension or renal failure are more vulnerable to dengue or heat strokes. Even mental health is affected. Many anecdotes reveal how sudden flooding in 2006, immersing entire housing floors in water... and loss of loved ones ... and material, documents... turned into depression or suicidal cases, especially in 50+ citizens." (sic)*

Discussion from "Urban practitioners capacity building" workshop organized by UHCRC<sup>11</sup>

Geo physical and socio demographic environment of the Surat city is conducive to vector breeding and vector born infections. In the 1950s, filariasis was a major health challenge for the city and in the 1990s, it was malaria including 'Falciparum malaria'. Filariasis was endemic to Surat and Malaria also continues to be one. Health risks during and after floods include plague, leptospirosis, malaria, Gastro etc. Post-flood re-emergence of plague in 1994 and leptospirosis in 2006 and 2013 is an additional public health challenge. Heat stress causes morbidity and has effect on all-cause mortality.

### **Box 3 Climate-health effects coupled with social impacts**

*"Plague was a social disaster than a medical. There was no plague in India since 1956 before Surat's case. Nobody teaches plague in medical colleges. In 1994, nobody knew about it... how it looks like, how it appears and how it can be treated... The social impact was high, people started leaving city with whatever vehicle they could get -scooter, motor, truck etc. The kind of psychological impact was there... city was empty completely... labourers and even doctors fled away."*

Former Deputy Commissioner, SMC<sup>12</sup>

*"The impact of urban health on city is very evident and I would relate health with industry is directly related, and seen also the productivity of the workers if we compare the workers on low lying areas and workers of Udhna, Pandesra and Ved road, even with the same raw materials and finished goods, their productivity is different, that is very much evident and those figures are available. A recent survey shows that that health does affect the productivity."*

SGCCI president & Chief Resilience Officer, Surat<sup>13</sup>

<sup>11</sup> Workshop Proceedings, (17<sup>th</sup> December 2018). Names of all workshop participants have been withheld for privacy.

<sup>12</sup> Personal communication, (October 2015). Names of all interviewees have been withheld for privacy.

<sup>13</sup> Personal communication, (December 2015). Names of all interviewees have been withheld for privacy.

## 2. Urban Health & Climate Resilience Center (UHCRC) Initiative

Most literature and action plans in resilience context have placed a lot of importance to institutional strengthening. However, its implementation world-wide appears to be the variable component– this implies resilience where leadership was most required but currently less prevalent.

Placed in this context, Urban Health & Climate Resilience Centre (UHCRC) initiative in Surat emphasised on evidence-based advocacy to Local Self-Government and demonstrated the unique models of capacity building of various city stakeholders. UHCRC project (2013-2016) was an interdisciplinary research, training, advocacy and network project, the first of its kind in India under the execution of health department of Surat Municipal Corporation. The seed funding of a project was by Asian City Climate Change Resilience Network (ACCCRN) of Rockefeller foundation.

### How overall resilience activities shaped up in Surat

The time-line and process behind institutionalising these initiatives was as follows:

<b>2008</b>	<b>Surat was selected as one of the pilot cities for Rockefeller Foundation's ACCCRN project.</b>
<b>5<sup>th</sup> January 2009 (World Environment Day)</b>	Discussion facilitated by a private agency, the TARU team, regarding rising frequency of flood in Surat city.
<b>2009</b>	Formation of 'City Advisory Committee'(CAC). CAC had 20 members (from SMC departments, academia and SGCCI), out of which 10-12 met on quarterly basis.
<b>2009-2011</b>	CAC developed a visioning exercise for Surat on parameters - water, energy and health. Urban health and Climate –Surat retrospective data analysis was carried out
<b>2009-2011</b>	Sectorial climate risks and vulnerability studies were conducted in 5 areas: health, water, energy, environment and flood. The studies were led by experts.
<b>April 2011</b>	Publication of "City Resilience Strategy" by SMC with the help of ACCCRN and TARU
<b>2009-2011</b>	Key ACCCRN outcomes <ul style="list-style-type: none"> <li>• A national competition for developing Town Planning scheme in Hazira area</li> <li>• As part of JnNURM, 55,000 units were built for resettlement</li> <li>• Design competition for architecture students to develop low cost housing along the creeks</li> <li>• Flood vulnerability, GIS mapping and socio-demographic survey</li> <li>• A Short Message Service (SMS) enabled Urban Services Monitoring System (UrSMS) was developed to allow the city officials to both</li> </ul>

	access real-time data and evaluate the performance of the city's water delivery, solid waste collection, and health systems
<b>June 2012</b>	Surat Climate Change Trust (SCCT) & Urban Health and Climate Resilience Centre (UHCRC) formation. The process was initiated by former municipal commissioner. No other ACCCRN 10 cities have included health and created an active work plan other than Surat.
<b>2013-2016</b>	UHCRC actions- <ul style="list-style-type: none"> <li>• Urban Resilience Assessment</li> <li>• Heat &amp; Health Action Plan</li> <li>• Advocacy for strengthening disease surveillance</li> <li>• Community Resilience Action models- piloting</li> </ul>
<b>2017 onwards</b>	UHCRC trust established (sustainability model)

*(The time-lines & process has been documented from archived interview transcripts of city stakeholders)*

After 2016, the project UHCRC has been institutionalised as UHCRC i.e. Urban Health and Climate Resilience Center of Excellence as the registered nonprofit trust. The UHCRC trust was registered in 2017. The trust is settled by commissioner of SMC, and members of trust board are representing public and private organisations.

The geographical scope of UHCRC & UHCRC has been primarily Surat city, however some of its activities were extended to urban Gujarat.



**Fig.1 The diagrammatic representation of collaborations in Surat**

*Emphasis on multi-stakeholder collaborations and interdisciplinary nature is evident in Surat's case. The resilience is possible when the maturing of partnerships between various stakeholders including the government (Surat Municipal Corporation & Surat Urban Development Authority), academia, citizens, NGOs, funding agencies, expert groups and the private sector.*

*Figure 3: UHCRC stakeholders mapping*

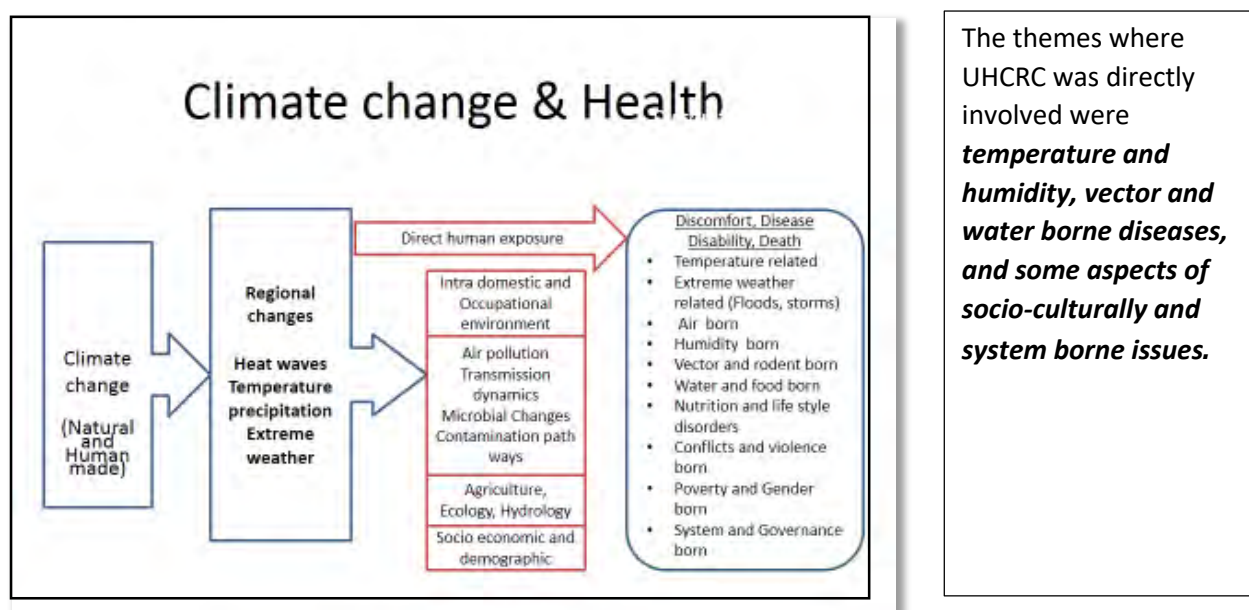
*Thematic scope of an overall climate & health sector is depicted in fig. 2 (as presented by UHCRC technical director).<sup>14</sup>*

<sup>14</sup> Personal communication, (20<sup>th</sup> November 2018). Names of all interviewees have been withheld for privacy.

## Box 5 UHCRC conceptualization

*Surat has a different set of working mechanisms and all the people who were a part of the City Advisory Committee CAC, I consider them as responsible for bringing together other set of people time and again. For example, the SGCCI which is one of the key bodies which has been supporting ACCRN initiative for day one has been responsible for organising meetings, providing space and bringing together lot of people together and similarly, SMC is hosting SCCT meetings and providing space for functioning of UHCRC.*

Head, TARU Leading Edge, Private consultancy involved in ACCRN<sup>15</sup>



The themes where UHCRC was directly involved were **temperature and humidity, vector and water borne diseases, and some aspects of socio-culturally and system borne issues.**

Figure 4: Thematic framework & UHCRC

## UHCRC key activities in Surat

### a. Climate and health vulnerability assessment

UHCRC worked on urban climate and health vulnerability assessment at four levels- municipal corporations of Gujarat, administrative zones of Surat city, census wards of city, and three sample slums. The indicators framework was finalized which examines vulnerability and resilience through four main dimensions: socio-demographic, climate, and public health.

Surat city Public Health Adaptation- a spatial vulnerability study report was designed to advocate that the process of managing the health risks of climate change should be

<sup>15</sup> Personal communication, (December 2015). Names of all interviewees have been withheld for privacy.

integrated into the overall city health adaptation planning, through assessing vulnerability, identifying, and prioritising options.

This study also outlined the methodological lessons learnt by UHCRC about public health vulnerability assessment. This is the first of its kind city vulnerability study based on factors that affect the health and well-being of communities. This study provided spatial vulnerability assessment of the Surat city as a bench mark.

Through this project, resilience was understood in different units and advocacy reports were submitted to SMC for evidence-based city planning process.

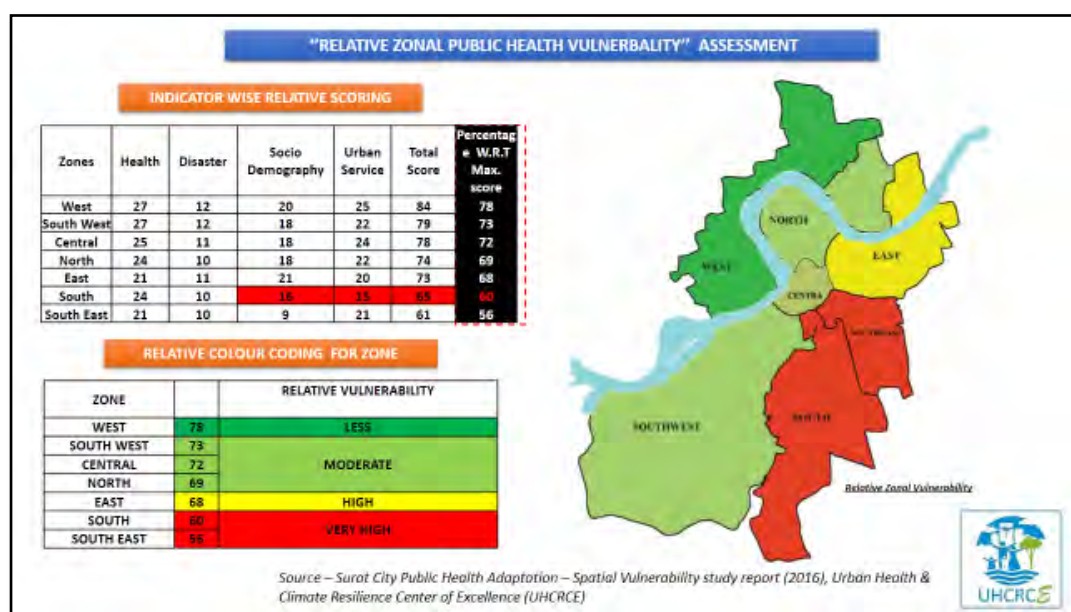


Figure 5: Snapshot of UHCRC Surat City vulnerability assessment work

## b. Heat & Health Action Plan

Global climate change results in prolonged summers and rise in temperature. Climate scientists all across the world are involved in empirical research and reporting impact of heat on health, productivity and overall development. The Ahmedabad heat action plan 2014 is the first evidence-based heat action plan in Asia and has drawn attention of all cities for action. Every city has a different context, and the initiative of one city can be a valuable guide for other cities. Despite being in same administrative state of India, Ahmadabad belongs to an arid zone while Surat city falls under a semi-arid zone. The major difference between the weather of Ahmadabad and Surat is in extreme temperature levels, duration and days, humidity and sea breeze. Surat climate and health data analysis of the perceived heat stressed year of 2010 showed 224 additional 'all cause' deaths in summer. This intrigued UHCRC to carry retrospective and prospective analysis of climate data and generate heat, humidity and heat index trends, further showing their association with mortality and morbidity. On basis of this evidence, UHCRC prepared evidence-based 'Heat and health Action Plan- Surat (HHAP-S)' as the first coastal city plan in India. Phase I of the HHAP was piloted in 2016 summer.



### c. Advocacy for strengthening disease surveillance

Documentation of disease surveillance during routine and during disasters (health monitoring and health management information systems) provides valuable insights about do's and don'ts and lessons learnt by Surat. For example, the 'Surat Health Sector Study' (2011) supported by ACCCRN is an important documentation of how intersectoral convergence is key for tackling water borne diseases and how Surat learnt tackling new resurgent infections like leptospirosis.

The urban health resilience initiatives also helped create the 'Urban Service Monitoring System', a web and mobile-based monitoring tool used for the daily surveillance of diseases such as tuberculosis, malaria and dengue for the municipal corporation.

#### Box 6

*"UrSMS was developed as a pilot project to see whether it could be used as a mechanism to collect real time disease data from all the hospitals that SMC collects data. Post UrSMS, we thought it was important to collect as well as analyse the data, so UHCRC was formed. The primary objective for forming UHCRC was to support health department to help analyse some of the data and develop mechanisms to look at some of the data and the information being collected."*

Head, TARU Leading Edge, Private consultancy involved in ACCCRN<sup>16</sup>

### d. Community Resilience Action models-piloting

Multi-stakeholder forums were created and run for durations of six months to one year. Formal consortiums were made for the sustainability of forums. Existing community structures were also strengthened, for example, the Mahila Arogya Samitis, women elected representatives and informal community groups.

The UHCRC community action models were-

#### *Model 1 -Surat Arogya Samvad*

'Surat Arogya Samvad' is a community health dialogue forum. It aims to exchange scientific and local climate and health information among citizens. 'Samvad' is organized periodically at one of the central venues of city with a dedicated theme. The event is publicized through newspapers, brochures and social media to attract various sections of society. UHCRC has successfully completed six Samvad events based on themes like gender links with climate and health, heat stress, water related diseases, swine flu etc.

---

<sup>16</sup> Personal communication, (December 2015). Names of all interviewees have been withheld for privacy.

### *Model 2 -Healthy Surat Working Group (HSWG)*

This serves as a local multidisciplinary technical group (public health, social science, urban planning) of academicians and professionals, unlike Samvad which is open forum for citizens. HSWG intends meaningful advocacy and recommendations for Municipal Corporation. Apart from two focused events (with themes of vector borne disease control and heat stress), HSWG is currently spreading its arms through informal consultations and academic collaborations.

### *Model 3 -Climate Smart Healthy Children: Peer educators' program*

This forum looks after involvement of the next generation and works on 'peer education' basis. The peer educators of one school impart the knowledge, skills and attitudes of healthy living actions to another school in creative ways. 'Student-to-student' model creates more interest and dialogue amongst recipient peers. The model has worked with three schools till date, ensuring a mix of public and private school interaction. Fighting against malaria and dengue, action against swine-flu, using motorbike pooling, food safety, healthy diet practices, green Surat, saving electricity – such climate and health messages are being discussed, demonstrated and acted upon by youngsters.

### *Model 4 - Surat Alliance for Urban Agriculture & Resilience (SAUAR)*

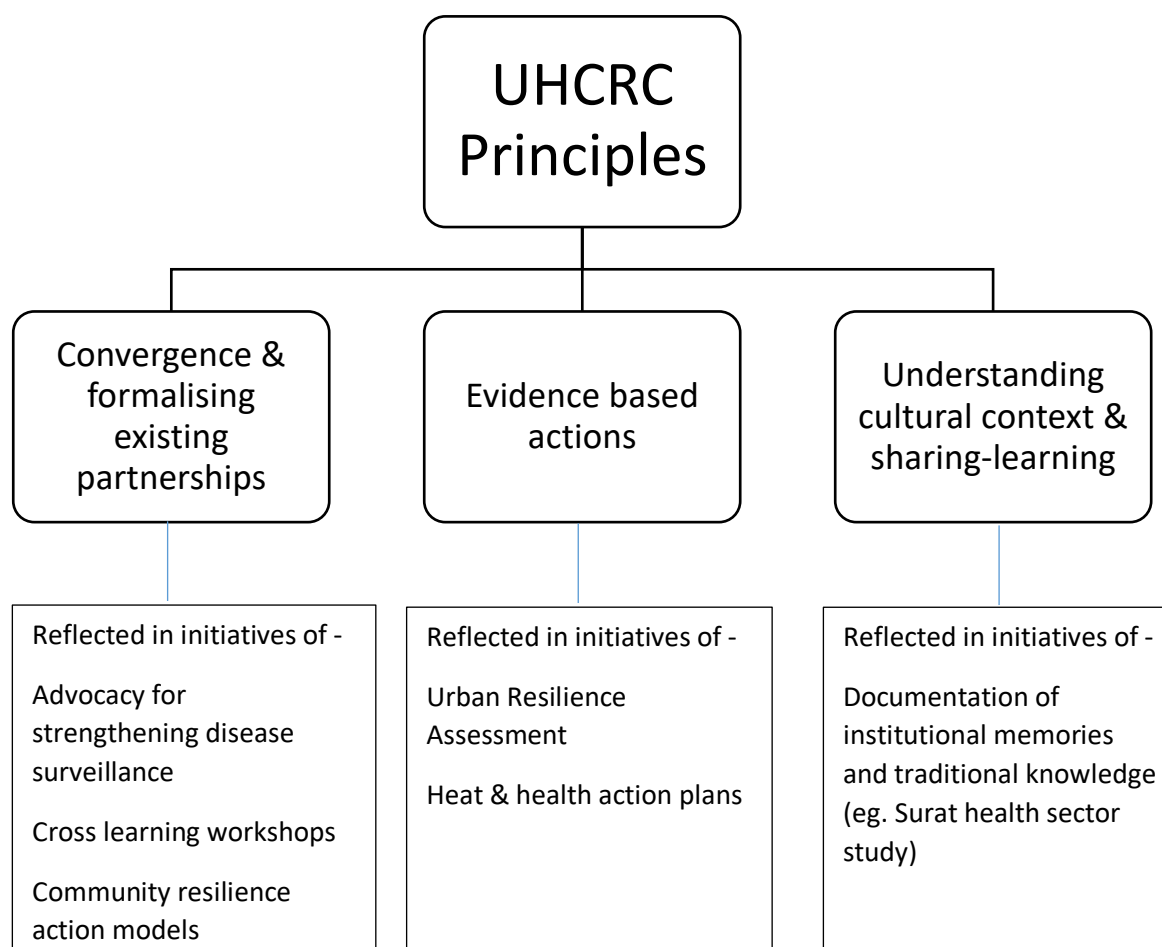
SAUAR is a multi-stakeholder partnership that promotes nutritious food through community training for urban agriculture. SAUAR also fosters social media-based information and support system. Till date, 202 individuals have received training under SAUAR ensuring its reach to urban poor population and community health workers. More than 150 have attempted or are successfully maintaining their terrace or kitchen gardens.

### *Model 5 -Community based climate & health surveillance*

This model enables networking facilitation process to bring all stakeholder of urban poor areas on one platform for community action. The action primarily includes disease surveillance where lay people through platforms like Mahila Arogya Samities or adolescents are trained to report disease cases of their locality, further expecting rapid response and action by system.

Multi-stakeholder partnerships and networking are at the heart of all five action models. As a way forward, UHCRC handed over these models to relevant city institutions through formal collaborations ensuring their sustainability.

### 3. Principles adapted by UHCRC in resilience leadership



#### Box 7

*"For climate and health resilience, 'doers' and 'learners' should be separate, but they should sit together, exchange their knowledge and generate 'evidence-based actions'. We must work with three E's – Engineering, Enforcement (of laws) and Education, which are specialities of different disciplines. If academic institutions are doing research, it must be shared with local government. There is a lot of institutional memory, for example, what we learnt from leptospirosis outbreaks. We should document this wisdom. Also, we must understand that 'community is the answer for resilience', provided that the capacity of community should be built simultaneously."*

Technical Director, UHCRC<sup>17</sup>

<sup>17</sup> Personal communication, (20<sup>th</sup> November 2018). Names of all interviewees have been withheld for privacy



### **a. Convergence & formalising partnerships**

UHCRC believed that urban areas need convergence so resilience leadership must bring different stakeholders together. Multiple city actors often work in silos and need some facilitation to hold them together. UHCRC approach relied on lessons learnt by Surat in various disasters that the partnerships in routine can strengthen partnership during disasters.

### **b. Evidence-based actions**

The UHCRC approach was to generate a systematic evidence base as urban resilience cannot function based on ad-hoc actions. Also, uncertainty of climate health events increases the importance of evidence-based decision making.

### **c. Understanding cultural context & sharing-learning**

UHCRC's approach was to ensure integrating the culture and way of life of the local community, institutions and the city as a whole in both practice and shared-learning processes. This approach has been emerged as project activities were progressed.

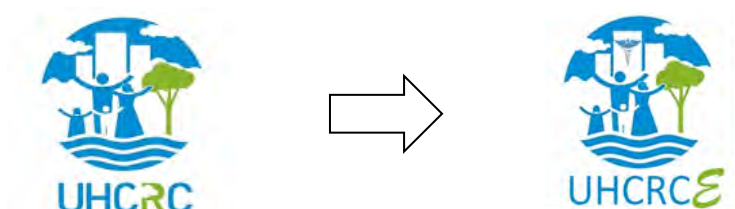
Interviews with different stakeholders reveal that this approach of UHCRC is rooted in resilience lessons learnt by city over past two decades.

Various examples and quotes shared by stakeholders demonstrate how city has adopted these approaches gradually through activities under various sectors (*Refer Exhibit 1 to read and assess how the three approaches can be alluded*).

#### 4. UHCRC sustainability

Based on successful UHCRC project experience, Urban health and Climate Resilience Centre of Excellence (UHCRCe) Trust was established and continues to work with other resilience activities since 2017.

Transformation:



This transformation shows the ownership of city authorities for sustaining resilience work even after the project ended.

#### Academic and advocacy publications by UHCRC

##### a. Urban Resilience assessment

Urban Health Inclusive Health Policy and Climate Resilience Inclusive Urban Health Policy, UN Climate Change Resilience: Policy Brief 5

<http://www.adaptationlearning.net/sites/default/files/resource-files/Policy%20Brief%205%20Urban%20Health%20and%20Climate%20Resilience.pdf>

Prepared Communities: Implementing the urban Community Resilience Assessment in Vulnerable Neighborhoods of Three Cities

<https://www.wri.org/publication/prepared-communities>

##### b. Surat work in heat and health action

Heat and Health Action Plan – Surat (Executive Report)

<https://smartnet.niua.org/content/8c946ff1-7f58-4ad3-ba04-4285e8fa5242>

<http://accrn.net/sites/default/files/publication/attach/Executive%20report%201%20-%20HEAT%20AND%20HEALTH%20ACTION%20PLAN.pdf>

Temperature and Humidity Variability for Surat Coastal City in India

[https://www.researchgate.net/publication/275501773\\_Temperature\\_and\\_Humidity\\_Variability\\_for\\_Surat\\_coastal\\_city\\_India](https://www.researchgate.net/publication/275501773_Temperature_and_Humidity_Variability_for_Surat_coastal_city_India)

News Article dated 11 March 2016: Summer plan to shield Surtis from heat

<https://timesofindia.indiatimes.com/city/surat/Summer-plan-to-shield-Surtis-from-heat/articleshow/51350984.cms>

Indian Journal of Community Medicine article: Summer temperature and spatial variability of all-cause mortality in Surat City, India

<http://www.ijcm.org.in/article.asp?issn=0970-0218;year=2017;volume=42;issue=2;spage=111;epage=115;aualast=Rathi>

Journal of Health Management article: Urban health System and Climate Resilience – Surat case study

[https://www.researchgate.net/publication/305786886\\_Urban\\_Health\\_System\\_and\\_Climate\\_Resilience--Surat\\_Case\\_Study](https://www.researchgate.net/publication/305786886_Urban_Health_System_and_Climate_Resilience--Surat_Case_Study)

VBDC advocacy: Surat Model of Public Private Partnership for Health Management Information System (HMIS) (Mediscene January 2015), Counting to reduce count – Surat: the city in India with universal mosquito borne disease surveillance (Article in ACCCRN)

### **c. Community resilience work**

Community resilience for heat stress: Experience from Surat city (India)

<https://www.acccrn.net/sites/default/files/publication/attach/Heat%20resilience%20ACCCRN.pdf>

Int J Res Med, 2016; 5(3); 93-96: Monsoon-in the views of urban people

[http://www.ijorim.com/siteadmin/article\\_issue/147807447321%20piyush.pdf.pdf](http://www.ijorim.com/siteadmin/article_issue/147807447321%20piyush.pdf.pdf)

Research article: Building Resilience to climate change and health – can adolescents in urban slums be the answer?

<https://www.acccrn.net/resources/research-article-building-resilience-climate-change-and-health-can-adolescents-urban-slums>

## IV. References

City Mayors Foundation. 2017. "The World's Fastest Growing Cities and Urban Areas from 2006 to 2020." [http://www.citymayors.com/statistics/urban\\_growth1.html](http://www.citymayors.com/statistics/urban_growth1.html). Accessed Jan 16, 2019.

Statistics for Surat Municipal Corporation

<https://www.suratmunicipal.gov.in/TheCity/Demographics>

Santha, Sunil D., Surinder Jaswal, Devisha Sasidevan, Kaushik Datta, Ajmal Khan, and Annu Kuruvilla. 2015. "Climate Change, Livelihoods and Health Inequities: A Study on the Vulnerability of Migrant Workers in Indian Cities." Working Paper 16. London: International Institute for Environment and Development.

Live Mint (6 December, 2018). Surat seen as fastest growing city in the world through 2035. Accessed at (<https://www.livemint.com/Politics/2IIYvfG7jS7KlKA6p8xeK/Surat-Bengaluru-Vijayawada-to-be-among-worlds-fastestgro.html>)

Inter-Governmental Panel on climate change, Working Group Reports. Accessed at <https://www.ipcc.ch/working-group/wg2/>

Ghanshyam Shah (1997) After the Plague

Surat Health Sector Study- India ACCCRN, 2011

Anguelovski I., Chu E., Carmin J., "Variations in approaches to urban climate adaptation: Experiences and experimentation from the global South", Global Environmental Change, 27 pp 156–167, 2014.

# V. Exhibits

## Exhibit 1:

Sr. no.	Example	Descriptive quote/ excerpt <sup>18</sup>
1	Public private partnership for sharing health data	“This partnership in public health field started in 1995-96 in the city, since the data of various diseases is very important and alone government disease statistics cannot give the health scenario of the whole city, for that even disease data from private institutions is also essential. So, in 1996 during the governance of Dr. Rao sahib-Commissioner SMC, we identified five private doctors whose practice was very good and were ready to share the data of their clinics with us. Thus, our health worker used to go to their clinics and collect the data and likewise we could gather the data and work with them... If we get today five cases of say a particular disease today and suddenly the number increases to ten the next day then we presume that there is some problem in that area and thus ask the concerned medical officer and ward office to find out the source of infection along with the patients and take corrective actions accordingly. Thus, on daily basis we compile the data and computerise it followed by detailed analysis of the cases... for e.g. how many confirmed dengue cases are seen today? How many cases occurred last month? We compare the cases of this year to the preceding year. Apart from this the municipal commissioner also reviews the data in monthly review meetings”.
2	Vector borne disease surveillance	“Departments such as water supply, drainage, education boards and irrigation play an important role in VBDC department’s activities. Apart from that construction- engineering department, urban health centers and tertiary care hospitals such as Maskati, SMIMER and Civil hospital were other departments were also cited to play a very importance role in vector borne disease surveillance.”
3	ACCCRN process	“Before ACCCRN initiative, there were individuals who were working in silos who did not understand that their efforts were collectively contributing to combating climate change.”
4	Post Plague reforms	“Post 1994 (Plague episode), under decentralisation within SMC was strengthened administrative leadership of Former Municipal Commissioner Mr. Rao. Zonal level meetings were regularly conducted where different departments used to share their work and such meetings became part of SMC’s work culture.”
5	Inter-departmental convergence	“There are SOPs for this. The striking example can be cited from post 2006 flood experience. One of the unique protocols was sharing of health data with water supply department for focusing high risk for detection of place of contamination and repairs and chlorination/

<sup>18</sup> The quotes 1,3,4,5,6, 8, 9, 11, 13, 14, 17 have been extracted from archived interviews accessed by the case authors (October-December 2015) and quotes number 2, 7, 10, 12, 15, 16 have been extracted from UHCRC’s participation in different meetings or personal communication during case writing period (July to December 2018)

	during disasters	super chlorination. Sharing of water quality data with health department to share information about the regions not showing free residual chlorine to focus on chlorine tablets and ORS packets distribution as well as IEC campaign."
6	Pre-monsoon meetings	"Maximum citizens prefer their family doctors for treatment. As a result, we know what community prefers, what are their concerns, how they behave... In our joint pre-monsoon meetings with North Zone health department of SMC, we contribute through knowledge from our routine practice..."
7	Joint sectoral meetings within SMC	"Monthly meetings with corporators, MP, MLA, local mayors, counselor, city engineers, additional city engineers is carried out wherein development and monitoring issues are discussed. Engineering and health issues are discussed on weekly basis. Commissioner, president come together in Samaniya Sabha and discuss the technical and non-technical issues of the city"
8	DMP preparation process	"We have started making our Disaster Management Plan (DMP) ward wise. Earlier we were making the DMP. We have started making the DMP from 2000... after 2006 we started repairing development plan zone wise, and now we are making DMP ward wise. Everybody is learning everything. It is part of the exercise. We arrange the meeting with doctors of every zone as a part of pre-monsoon activity. We have meeting with NGOs at Zone level. Then at a center level which had been used to address by our mayor and commissioner- and we take their views of NGOs"
9	Academic partnerships with SMC	"2006 flood episode was a big panic for entire city and characterised by enormous losses around 23000 crores. Everybody wanted the scientific work and solutions. This stemmed need of dedicated research work in "Water resource and flood management". Two questions need to be answered: what the total discharge is passing through the city and what could be the water levels in various parts of the Surat city. For Tapi basin modelling studies conducted by SVNIT, involvement of Central Water Commission, SMC, Narmada Water Resource Department was crucial in terms of sharing needed raw data, otherwise we were unable to contribute for this city. SMC officials, being part of Flood Monitoring Committee, were too keen for flood management solutions. In 2013, we presented findings to Commissioner and city engineer. We had four rounds of intense discussions. We believe that researchers and policy makers should work together."
10	Advocacy for better birth & death registration	"UHCRC started with analysis of available birth and death registration data. It's a rich source of information which remains unutilized. SMC compared to other corporations have better data records. We analysed it and arranged advocacy meetings with those who handle the data for improvement in compilation and entry."
11	Documentation of flood/ Plague	"We have no choice but to live with floods. It is bound to come, whether we like it or not, whether it rains or not. In 2006, there was not a drop of water falling from the sky. It was sunny, but the water was rising. Almost 70-80% of the city was under an average of three

	recovery memories	feet of water. Resilience is natural to the people. . . we came back in less than three weeks' time."
12		"When Rao <i>Sahib</i> (former commissioner, SMC) told us to shift on 2 <sup>nd</sup> floor, we took it seriously and moved on terrace of nearby society" – (Citizens while reporting 2006 flood rescue operations stories)
13		"Surtis are helpful by nature and insist on helping others in difficult times with whatever resources they have."
14		"Plague was a social disaster than a medical. There was no Plague in India since 1956 before Surat's case. Nobody teaches Plague in medical colleges. In 1994, nobody knew about it- how it looks like, how it appears and how it can be treated. The social impact was high, people started leaving city with whatever vehicle they could get -scooter, motor, truck etc. The kind of psychological impact was there... city was empty completely... labourers and even doctors fled away."
15	Traditional knowledge documentation	"Surat heritage literature discusses how in 17th century, Surat was repeatedly raided by the Marathas. The description of 400 years old structure, Nagarshethni Haveli, depicts <i>Social Resilience</i> from History. The structure carries a legacy through generations of the Nagarsheth family. The haveli had an underground basement. During raids, the residents used to disappear "underground" with all their wealth and come out at Tapi river bank, where their boats used to be waiting to take them across the river. They would thus flee the city."
16	Institutional culture memories documentation	"In case of Surat, not being a metropolis city like Bombay or Delhi, various stakeholders in city already had a network wavelength with each other due to some or the other purpose. Stakeholders often interact and work each other at different forums. People very well knowing each other creates a ground for building mutual trust. Also, there are personnel who act as "connecting link" between two stakeholders, for example, director of academic institution being technical committee member of SMC or alumni of academic institute being SMC officials. These factors worked as enablers for platforms like UHCRC OR SCCT"
17		"Working in SMC is actually a 'Government' duty... But we often feel proud to be here..."

## About IIHS

The Indian Institute for Human Settlements (IIHS) is a national education institution committed to the equitable, sustainable and efficient transformation of Indian settlements. IIHS aims to establish an independent funded and managed National University for Research and Innovation focused on the multi-sectoral and multi-dimensional challenges and opportunities of urbanization. The University is intended to be a globally ranked institution. The IIHS is a proposed network of mother and daughter institutions across South Asia, leveraging on the local and regional knowledge and innovation and linking them to global best practices. Its mother campus, based in Bengaluru, will include academic, research and social infrastructure, student and faculty housing. This campus is expected to set international standards for efficient, economic and sustainable design, operations and maintenance.







**iihs**®  
INDIAN INSTITUTE FOR  
HUMAN SETTLEMENTS

**IIHS BENGALURU CITY CAMPUS**

197/36, 2<sup>nd</sup> Main Road, Sadashivanagar, Bengaluru 560 080. India.  
T +91 80 6760 6666 | F +91 80 2361 6814

**IIHS CHENNAI**

Floor 7A, Chaitanya Exotica, 24/51 Venkatnarayana Road, T Nagar  
Chennai 600 017. India. T +91 44 6630 5500/6555 6590

**IIHS DELHI**

803, Surya Kiran, 19, Kasturba Gandhi Marg, New Delhi 110 001. India.  
T +91 11 4360 2798 | F +91 11 2332 0477

**IIHS MUMBAI**

Flat No. 2, Purnima Building, Patel Compound, 20-C, Napean Sea Road  
Mumbai 400 006. India. T +91 22 6525 3874

**[iihs.co.in](http://iihs.co.in)**